BULLETIN
of the
Chicago Herpetological Society

Volume 35, Number 2
February 2000

BULLETIN OF THE CHICAGO HERPETOLOGICAL SOCIETY
Volume 35, Number 2
February 2000

A Case of Parthenogenesis in the Plains Garter Snake, *Thamnophis radix* . . . . . John C. Murphy and Russell M. Curry 17

New Distributional and Variational Data on Some Species of Snakes from Chihuahua, Mexico . . . . . Julio A. Lemos-Espinal, Hobart M. Smith and David Chiszar 19

The Annamese Flying Frog . . . . . Evgeny Ryboltovsky 25

Chicago Wilderness Frog Surveys—Get Involved, Herpers! . . . . . Bill Leja 28

HerPET-POURRI . . . . . Ellin Beltz 30

ReptileFest 2000 Wake-up Call . . . . . Gary Kostka 33

Unofficial Minutes of the CHS Board Meeting, January 14, 2000 34

Herpetology 2000 36

The Tympanum . . . . . David Lawson; Wes von Papineau 38

Advertisements 39

News and Announcements 40

Cover: Adult female yellow phase plains garter snake, *Thamnophis radix*. Photograph by John C. Murphy.

STAFF

Editor: Michael A. Dloogatch
Advertising Manager: Ralph Shepstone

1999 CHS Board of Directors

Jack Schoenfelder, President
Lori King, Vice-President
Gary Fogel, Treasurer
Karen Bielski, Recording Secretary
Steve Spitzer, Corresponding Secretary
Marcia Rybak, Publications Secretary
Michael A. Dloogatch, Membership Secretary
Greg Brim, Sergeant-at-Arms
Rich Crowley, Member-at-Large
Jon "Iggy" Ihrig, Member-at-Large
Linda Malawy, Member-at-Large
Jenny Vollman, Member-at-Large

The Chicago Herpetological Society is a nonprofit organization incorporated under the laws of the state of Illinois. Its purposes are education, conservation and the advancement of herpetology. Meetings are announced in this publication, and are normally held at 7:30 P.M., the last Wednesday of each month.

Membership in the CHS includes a subscription to the monthly *Bulletin*. Annual dues are: Individual Membership, $22.00; Family Membership, $25.00; Sustaining Membership, $50.00; Contributing Membership, $100.00; Institutional Membership, $38.00. Remittance must be made in U.S. funds. Subscribers outside the U.S. must add $12.00 for postage. Send membership dues or address changes to: Chicago Herpetological Society, Membership Secretary, 2060 N. Clark Street, Chicago, IL 60614. Publications are sent to U.S. members via third class bulk mail; the post office does not forward such mail, even if a special request is made to forward magazines.

Manuscripts published in the *Bulletin of the Chicago Herpetological Society* are not peer reviewed. Manuscripts should be submitted, if possible, on IBM PC-compatible or Macintosh format diskettes. Alternatively, manuscripts may be submitted in duplicate, typewritten and double spaced. Manuscripts and letters concerning editorial business should be sent to: Chicago Herpetological Society, Publications Secretary, 2060 N. Clark Street, Chicago, IL 60614. **Back issues** are limited but are available from the Publications Secretary for $2.50 per issue postpaid. **Visit the CHS home page at <http://www.Chicagoherp.org>.**

The BULLETIN of the Chicago Herpetological Society (ISSN 0009-3564) is published monthly by the Chicago Herpetological Society.

Copyright © 2000.

Bull. Chicago Herp. Soc. 35(2):17-19, 2000

A Case of Parthenogenesis in the Plains Garter Snake, *Thamnophis radix*

John C. Murphy
Division of Amphibians and Reptiles
Field Museum of Natural History
Chicago, IL 60605

Russell M. Curry
1360 N. Grove Avenue
Palatine, IL 60067

Parthenogenesis in vertebrates was first recognized by science in 1932 when Hubbs and Hubbs discovered the live-bearing fish species, *Poecilia formosa*, was composed exclusively of females. But even before this, rumors of all-female species circulated among fish hobbyists at the turn of the twentieth century (Breder and Rosen, 1966). The first snake shown to be parthenogenetic was the Brahminy blind snake, *Ramphotyphlops braminus*. McDowell (1974) first suggested this, when he discovered that of 114 specimens in which he could determine the sex, all were females. Nussbaum (1980) lent more support to this idea, and Ota et al. (1991) demonstrated that this was a triploid, all-female species by determining its karyotype.

The literature on parthenogenesis in squamate reptiles was reviewed by Dawley (1989) and he noted that all known parthenogenetic squamates had a population structure that was unisexual (all-female) and of hybrid origin, and that if males occurred, they were extremely rare. Schuett et al. (1997) presented four cases of parthenogenesis in bisexual, diploid snakes. [The term bisexual refers here to populations that are composed of both males and females.] In each of these four cases they ruled out the possibility that the births were the result of long term sperm storage because males were never present, or males had been absent for long period of time. They reported parthenogenesis in two colubrids (the wandering garter snake, *Thamnophis elegans vagrans*; and the checkered garter snake, *Thamnophis marcianus*), and in two pit vipers (the timber rattlesnake, *Crotalus horridus horridus*; and the Aruba Island rattlesnake, *Crotalus unicolor*). In the cases of *T. e. vagrans* and *C. h. horridus*, DNA fingerprinting demonstrated that the parent and offspring were indeed genetically similar. Additionally, Dubach et al. (1997) reported parthenogenesis in the completely aquatic Australian Arafuran file snake, *Acrochordus arafurae*, in a female shown to be diploid. In three of five of these cases, the female snakes produced offspring that were positively identified as males.

The mechanism to explain this phenomenon given by Schuett et al. (1997) and Dubach et al. (1997) is automictic parthenogenesis. Ova are produced by meiosis, however during meiosis II the secondary polar body fuses with the nucleus of the ovum in the absence of sperm. This allows a female snake to produce both male and female offspring asexually. Snakes have a ZW sex chromosome system (females are ZW and males are ZZ). Thus, a secondary oocyte with a Z-chromosome in the nucleus and a Z-chromosome in the polar body nucleus that undergoes automictic parthenogenesis will be a male. Whereas a secondary oocyte with a W-chromosome in the nucleus and a Z-chromosome in the secondary polar body nucleus (or the reverse) will produce a female offspring should they fuse. See Schuett et al. (1998) for an illustration and further discussion of this process.

One of us (RC) purchased a neonate garter snake at Zoological Pets, in Arlington Heights, Illinois, in August 1993. The female snake was in a 20-gallon aquarium with about 30 other neonate garter snakes. The snake stood out because of its yellow coloration; the others were darker in color. At the time of purchase she was 15 to 17 cm long. The snake was fed small guppies and worms, and as she grew she was fed on nightcrawlers and goldfish. The last few years rat pinkies have been added to her diet. In May 1996 the female garter snake produced a litter of three live young and two stillborn young, despite the fact that it had never been in contact with a male snake. The offspring had the same unusual pattern as their mother and were about 15 cm long. The three young were housed with their mother for a few weeks and one day they disappeared. Presumably the female cannibalized them since there was no way they could have escaped. In June 1997, a single offspring was produced with several infertile eggs. This neonate died the day it was born. It was frozen, then preserved

Figure 1. The adult female plains garter snake, *Thamnophis radix*, purchased by RC. Compare the dorsal pattern on this animal to its asexual offspring in Figure 2. Photograph by John C. Murphy.

Figure 2. The offspring of the female snake in Figure 1. Photograph by John C. Murphy.

Table 1. A comparison of the adult female garter snake and her male offspring to *Thamnophis marcianus* and *Thamnophis radix*.

Character	Adult female	Neonate male	Range for *Thamnophis m. marcianus*	Range for *Thamnophis radix*
anterior scale rows	20	20	21	19 or 21
midbody scale rows	19	19–21	19	19
posterior scale rows	17	17	17	17
ventrals	148	147	F 134–166; M 136–173	F 135–174; M 138–175
subcaudals	58	69	F 56–77; M 64–82	F 54–74; M 64–88
upper labials	9-8	7-7	7–8 (usually 8)	6–8 (usually 7)
lower labials	11-12	10-10	9–11 (usually 10)	8–11 (usually 9 or 10)
relative tail length	25%	20.6%	F 18.9–26.9%; M 21.3–26.8%	F 17.6–27.5%; M 20.5–27.8%
lateral stripe	3rd scale row, barely onto 4th	none	3rd scale row only	3rd and 4th scale rows
vertebral stripe	even-edged: 0.5+1+0.5	even-edged: 1 row	jagged-edged	even-edged
ventral pattern	black spots on outer edges of ventral scales	same as female	immaculate venter	black spots on outer edges of ventral scales

in 95% ethanol and it is now cataloged into the Field Museum collection (FMNH 257839).

Description of Adult Female

The adult female has a snout–vent length (SVL) of 640 mm, and the tail is 160 mm. This specimen is alive at this writing. Traditional scale count data are provided in Table 1. The dorsal scales have exceptionally heavy keels, so much so that the snake has a texture comparable to rough sandpaper when handled. It has an orange vertebral stripe that is on scale row 11 at midbody (the vertebral row) and extends onto the adjacent half of the paravertebral scale rows 10 and 12. This stripe has an even edge. The ventral scales are unusual in that they have a light orange center with a small black dot on the outer edges of each ventral scale. The lateral stripe is difficult to detect in this specimen, but it is present as a very light, white stripe on scale row three and at some locations extends just onto scale row four. There are three rows of black spots on each side of the vertebral stripe; these are on dorsal scale rows 1-2, 5-6 and 8-9. The rest of the dorsal coloration is yellow.

Description of Offspring

The male offspring has an SVL of 142 mm, the tail is 37 mm. The dorsal scales are keeled and in 20-21-17 rows. The ventral scales number 147. The umbilical scar is on ventrals 132 and 133. The subcaudals number 69. There are seven upper labials on both sides, and labials 3 and 4 enter the orbit on both sides of the head. The lower labials number 10 on both sides. There is one preocular, one supraocular, and three postoculars. The temporal formula is 1:1:2/1:2:3. The gulars number two. There is no trace of a lateral stripe on scale rows 1–4. The vertebral stripe involves only one row of scales and becomes less distinct posteriorly, but is still visible. The belly is uniform in color except that each ventral has a small black spot on the outer edge of each scale; these are larger than those in the female. Three rows of dark spots on each side make up the rest of the dorsal pattern. The spots occur on scale rows 1-2, 5-6, and 8-9. The scales on the crown have some round dark spots; these are most obvious and numerous on the parietals.

Thus the offspring is very similar to the female in overall appearance, except it lacks any trace of a lateral stripe and it has 19–21 scale rows at midbody. The row counts of 21 at midbody are due to extra, smaller scales, not entire rows.

The Taxonomic Identity of These Garter Snakes

Using the key to the species and subspecies of *Thamnophis* in Rossman et al. (1996), the adult female keys directly to the checkered garter snake, *Thamnophis marcianus*. However, because the snake has an unusual color pattern making it quite different in overall appearance from *T. marcianus* we investigated further. The small black spots on the ventral scales are not characteristic of *T. marcianus marcianus*, but they do occur in the other two recognized subspecies of *T. marcianus* (*T. m. bovallii*, and *T. m. praeocularis*), and they also occur in *Thamnophis radix*. In fact, an inspection of Table 1 shows that the specimens agree most closely with *Thamnophis radix*, and the female keys to *marcianus* only because the lateral stripe is mostly restricted to the third row of dorsal scales instead of the third and fourth rows. An alternative hypothesis to this snake being *T. radix*, is that it is a hybrid *marcianus* × *radix*. Smith (1946) reported on a specimen from Meade County, Kansas, he believed may have been a *marcianus* × *radix* hybrid, but he does not mention the dominant yellow coloration or the unusual scale keels present in these specimens. We are currently re-

jecting this hypothesis because of the number of characters in Table 1 that suggest that it is an aberrant *radix* and not a hybrid. Additionally, we have reason to believe that the pet shop that sold the snake obtained them from a local population, or at least a local collector. *Thamnophis marcianus* does not occur in Illinois. *Thamnophis radix* and *T. marcianus* share an incredible number of character states that are identical or greatly overlap, yet we doubt that there are any herpetologists who would consider them conspecific. These two specimens appear to be yellow color morphs of *Thamnophis radix*.

Literature Cited

Breder, C. M., and D. E. Rosen. 1966. Modes of reproduction in fishes. Jersey City: TFH Publications.

Dubach, J., A. Sajewicz and R. Pawley. 1997. Parthenogenesis in the Arafuran filesnake (*Acrochordus arafurae*). Herpetological Natural History 5:11-18.

Dawley, R. M. 1989. An introduction to unisexual vertebrates. Pp. 1-18. *In*: R. M. Dawley and J. P. Bogart, editors, Evolution and ecology of unisexual vertebrates. The New York State Museum, Museum Bull. 466:1-302.

Hubbs, C., and L. Hubbs. 1932. Apparent parthenogenesis in nature, in a form of fish of hybrid origin. Science 76:628-630.

McDowell, S. 1974. A catalogue of the snakes of New Guinea and the Solomons, with special reference to those in the Bernice P. Bishop Museum, Part 1. Scolecophidia. J. Herpetology 8:1-57.

Nussbaum, R. A. 1980. The Brahminy blind snake (*Ramphotyphlops braminus*) in the Seychelles Archipelago: Distribution, variation, and further evidence of parthenogenesis. Herpetologica 36:215-221.

Ota, H., T. Hikida, M. Matsui, A. Mori and A. H. Wynn. 1991. Morphological variation, karyotype and reproduction of the parthenogenetic blind snake, *Ramphotyphlops braminus*, from the insular region of East Asia and Saipan. Amphibia–Reptilia 12:181-193.

Rossman, D. A., N. B. Ford and R. A. Seigel. 1996. The garter snakes, evolution and ecology. Norman: University of Oklahoma Press.

Schuett, G. W., P. J. Fernandez, W. G. Gergits, N. J. Casna, D. Chiszar, H. M. Smith, J. B. Mitton, S. P. Mackessy, R. A. Odum, and M. J. Demlong. 1997. Production of offspring in the absence of males: Evidence for facultative parthenogenesis in bisexual snakes. Herpetological Natural History 5:1-10.

Schuett, G. W., P. J. Fernandez, D. Chiszar, and H. M. Smith. 1998. Fatherless sons: A new type of parthenogenesis in snakes. Fauna 1(3):20-25.

Smith, H. M. 1946. Hybridization between two species of garter snakes. Univ. Kansas Publ. Mus. Nat. Hist. 1:97-100.

Bull. Chicago Herp. Soc. 35(2):19-24, 2000

New Distributional and Variational Data on Some Species of Snakes from Chihuahua, Mexico

Julio A. Lemos-Espinal[1], Hobart M. Smith[2] and David Chiszar[2]

Abstract

Locality records for 16 species and subspecies of snakes from Chihuahua, most accompanied by GPS coordinates and altitude, obtained during summer 1999 by JLE, include a range extension for *Bogertophis s. subocularis*; resurrection, range extension and a new, possibly diagnostic character for *Conopsis nasus labialis*; a range extension for *Hypsiglena torquata jani*; the first record in Chihuahua of an intergrade between *Masticophis flagellum lineatulus* and *M. f. testaceus*; the first precise locality of occurrence in the state for *Crotalus l. lepidus*; a range extension for *C. l. klauberi*; a range extension in the state for *C. m. molossus*; and data on all specimens, including position of the umbilicus in both species of garter snakes, *Crotalus atrox, C. p. pricei* and *C. s. scutulatus*.

Among the specimens obtained by JLE during the summer of 1999 in Chihuahua are 51 snakes of 16 species and subspecies. Most are from areas never sampled herpetologically before, and therefore are of special interest and are here reported. Because of the remoteness of most localities, coordinates determined by GPS are provided to aid in their fixation, and altitudes are also given. We here cite JLE field numbers, but all specimens are ultimately to be deposited, about equally, in the University of Colorado Museum and in the collections of Unidad de Biotecnología y Prototipos of the Escuela Nacional

1. Laboratorio de Ecología, Unidad de Biotecnología y Prototipos, Escuela Nacional de Estudios Profesionales Iztacala, UNAM, Apartado Postal 314, Avenida de los Barrios s/n, Los Reyes Iztacala, Tlalnepantla, Estado do México, 54090 México.

2. University of Colorado Museum, Boulder, CO 80309-0334.

de Estudios Profesionales Iztacala of the Universidad Nacional Autónoma de México. Common names follow Liner (1994).

Bogertophis s. subocularis (Brown), Trans-Pecos Rat Snake. A single specimen (JLE 3848) was found DOR at km 19 on the Coyame–El Carrizo road (19 km S 29°40′8.7″N, 105°19′10.9″W, 1510 m), July 16. It is an adult male, 938 mm TTL, 127 mm TL; scale rows 29-33-21, ventrals 264, subcaudals 71, supralabials 10-11, infralabials 14-15, preoculars 1-1, postoculars 2-2, temporals 3-4 and 3-5, suboculars 3-3, subocular labials 5-6-7 and 5-6, body blotches 22, tail blotches 8. These features are normal for the subspecies, but the locality represented is a few kilometers northwest of previous records close to the Río Conchos (Webb, 1990).

Conopsis nasus labialis Tanner, Chihuahuan Earth Snake. A single specimen (JLE 4012) was taken 25 July on Mesa de Ejido, on the east side of the cemetery at Guachochi (26°49′15.6″N, 107°4′9.7″W), 2238 m. This locality extends the known range of the subspecies about 100 km SE of the four closely-grouped localities from which it has previously been known in the vicinity of Creel. The specimen is an adult female 200 mm TTL, 30 mm TL, with 127 ventrals, 30 subcaudals, 6-7 supralabials (2nd and 3rd contacting orbit on one side, 3rd and 4th on the other), 5-6 infralabials, 0-0 loreals, and 54 transverse dark streaks on body.

Goyenechea (1995) did not recognize this subspecies, primarily because of the few specimens then known (15), their very restricted geographic source, and the occurrence of equally reduced supralabial counts elsewhere in the species. The present specimen documents a considerably greater distribution and, in conforming in the diagnostic feature of a reduced number of supralabials, indicates that the subspecies is tenable on the basis of present knowledge. Indeed, we can add another striking character that may distinguish the subspecies, namely that in this specimen *in life its dorsal spots were conspicuously red*, although no vestige of that color now remains.

This taxon may well be a tertiary subspecies, isolated from the range of the nominotypical subspecies, which is known as near as central Durango. No records are known of either subspecies from areas between central Durango and Guachochi. The valleys of the Río Nazas system may possibly constitute a barrier between the ranges of the two subspecies, much as it appears to be between the ranges of *Sceloporus slevini* and *S. scalaris brownorum* (Smith et al., 1997: 295).

The 16 specimens now recorded of *C. n. labialis* are at present distinguishable with certainty from *C. n. nasus* solely on the basis of usually (88%, 14 of 16) having fewer than 7-7 supralabials, as opposed to at most 13% in the nominotypical subspecies fide Tanner (1961: 18). Data on infralabials in Goyenechea (1995: 19) indicates a marked difference in number of infralabials also, with only 1 of 12 (8%) *C. n. labialis* having fewer than 7-7, as opposed to 75 of 104 (72%) *C. n. nasus*. However, the number of infralabials is not as objectively determined as the number of supralabials; Tanner (1961), for example, counted the infralabials in the 15 types of *C. n. labialis* as 5-6(1), 6-6(11), 6-7(1) and 7-7(2). Standardization of methodology would be required to verify a diagnostically useful difference in number of infralabials in the two subspecies. A possibly unique feature of *C. n. labialis* in having red dorsal spots remains to be explored in the future.

A geographic analysis of pattern in *C. nasus* would be of considerable interest. Tanner (1961: 17, fig. 6) described and illustrated the pattern of the 15 types as having a "dotted" pattern of numerous, small, more or less rounded or squarish vertebral dark spots. The specimen here reported, on the contrary, has a "tessellated" pattern of equally numerous transverse streaks much as illustrated by Tanner (1961: 17, fig. 8) for *C. n. nasus* from Durango. A still further "maculata" pattern occurs in *C. n. nasus*, with large dark spots, as illustrated in Taylor and Smith (1942: 357, pl. 32) and noted (p. 331) as of possible taxonomic significance.

Heterodon nasicus kennerlyi Kennicott, Mexican Hognose Snake. A single specimen (JLE 4408) was taken 1 September near Lomas El Berrendo (29°43′23.9″N, 105°19′30.9″W), 1480 m. This locality appears to be a short distance north of the six spots for the species on the map in Walley and Eckerman (1999). Although that group of spots is the only area indicated in Walley and Eckerman (1999) where the species is recorded in Chihuahua, there are several records in the literature for other areas in the state, e.g. in Tanner (1985) for 54 mi S Cd. Juárez, 3–5 mi SE Nuevo Casas Grandes, and Tinaja Valley; in Smith (1943) for Progreso, Corralitos, and 27 km W Carmen; and in Domínguez et al. (1977) for 28 km W Palomas and 14 km N Cuauhtemoc. In addition, we are aware of several other museum specimens from Chihuahua: CAS 139670 from Aldama; MSB 2149 from 85.3 mi. N Chihuahua, Hy 45; and UCM 46078 from 12.5 mi S Jiménez.

Although no localities for the species are indicated in Walley and Eckerman (1999) for Durango, several literature records exist: in Smith (1943) for Tlahualilo; in Webb (1984) for 9 mi NE of Durango and 29 km N Durango; in Lazcano (1988) for 26 km from Gómez Palacio; and in Campbell and Lamar (1989) for Gómez Palacio.

The present specimen is a male, 304 mm TTL, 45 mm TL. It has 23-23-29 scale rows, 125 ventrals (fewer than the minimum of 129 recorded in Walley and Eckerman, 1999), 8-8 supralabials, 11-11 infralabials, 5 accessory and azygous scales, 1-1 loreals, 9-10 circumorbitals, 4-5 and 4-6 temporals, and 35 dorsal blotches posterior to the triple nuchal blotch.

Curiously, the statistics of the difference between the two subspecies of *H. nasicus* in number of loreals have never been published. As stated by Platt (1969: 282), *H. n. nasicus* generally has two or more on each side (at least up to four fide Smith, 1943: 433), whereas *H. n. kennerlyi* usually has one, occasionally 2, rarely none. The distinction is no doubt valid, but extensive hard data are much to be desired.

Hypsiglena torquata janii (Dugés), Texas Night Snake. A single specimen (JLE 4298) was taken 31 August SW Santa Anita (at 29°40′14.9″N, 105°16′44.0″W), 1490 m. It is a male, 371 mm TTL, 64 mm TL, with 21-21-16 scale rows, 169 ventrals, 53 subcaudals, 8-8 supralabials (4th and 5th entering orbit), 11-11 infralabials, 2-2 preoculars and postoculars, 1-1-3, 1-2-3 temporals, 55 blotches on body posterior

to nape triad blotch, no nuchal collar, postocular dark stripe separated from nuchal blotch. Its locality lies in the middle of a large area in eastern Chihuahua and western Coahuila from which no records were available for Dixon and Dean's (1986) review of this group of the genus. It is relatively close however to numerous records in Presidio county, Texas, and its characteristics conform with those of that area (Dixon and Dean, 1986: 311).

Masticophis flagellum lineatulus Smith × *testaceus* (Say), Lined × Western Coachwhip. A single adult male (JLE 3738) was taken 9 July at Polvorillas (=Piedras Encimadas), at the town reservoir (28°47′36.2″N, 104°13′30.8″W), 1440 m. It measures 1726 mm TTL, 419 mm TL, and has 17-17-13 scale rows, 192 ventrals, 113 subcaudals, 8-8 supralabials 4th and 5th entering orbit), 10-11 infralabials, 2-2 preoculars and postoculars, 2-2-3 and 2-3-3 temporals.

The only subspecies of *M. flagellum* occurring in Chihuahua is, according to Wilson (1970: 39; 1973: 1) *M. f. lineatulus*. However, no records were available to him from the eastern part of the state in the vicinity of the Río Bravo del Norte, on the east side of which, in the Big Bend counties (Presidio, Brewster) of Texas, *M. t. testaceus* occurs.

The present specimen appears to be an intergrade between these two subspecies, and the first recorded from the state of Chihuahua. We regard it as an intergrade because the usual diagnostic black median line on the anterior dorsals is missing. The dorsals 2–3 head lengths posterior to the head are immaculate yellowish, as in *M. f. testaceus*. Posterior to that point a very faint central tan streak is present on most scales, especially toward the middorsum, becoming gradually more distinct and brownish on more posterior parts of the body, and also becoming broader, so as to occupy all but the basal third of each scale. On no part of the body are the scale marks black, as is characteristic of *M. f. lineatulus*. Likewise the usual dark spot at the ends of the ventrals on the anterior part of the venter are only faintly visible on the anterior 18 ventrals. However, the posterior edges of the ventrals on the rear half of the body, and on all of the caudals, are salmon-colored, as is characteristic of *M. f. lineatulus*.

Masticophis taeniatus girardi (Stejneger and Barbour), Central Texas Whipsnake. A single specimen (JLE 3899) was taken 9 July at Llano El Nito (28°47′59.0″N, 104°13′38.4″W), 1450 m. It is a young male, 760+ mm TTL, 227+ mm TL, with 15-15-11 scale rows, 198 ventrals, 123+ subcaudals, 8-8 supralabials (4th and 5th entering orbit), 10-10 infralabials, 1-1 loreals, 2-2 preoculars, 3-3 postoculars and 2-2-2 temporals. Paired apical pits are visible on some anterodorsal scales, are absent on much of the body, and often only one of the pair is well developed. Only one transverse light band is evident, back of neck, the nuchal light collar is poorly defined, and the venter exhibits only faint evidence of the dark pigmentation usually present in adults. Its body pattern closely resembles that of figure 13A in Camper and Dixon (1994: 21) except that the dark lines on the lateral three scale rows are less distinct from the dark background on those scale rows. The specimen resembles intergrades between *M. t. taeniatus* and *M. t. girardi*, but only because it is a juvenile. The locality where it was taken is well within the established range of *M. t. girardi* (Camper and Dixon, 1994: 3; Camper, 1996: 1).

The specimen was found moving in mesquite. It contained a *Cnemidophorus gularis septemvittatus* in its stomach.

A second specimen (JLE 1857), even younger, was taken 24 March 1997 at Cerros Colorados (31°9′3.3″N, 106°22′31.3″W), 1380 m.

Pituophis catenifer affinis Hallowell, Sonoran Gopher Snake. Five specimens of this, the most common, widely distributed colubrid of the state, are as follows: Lomas El Berrendo (29°42′16.5″N, 105°19′34.9″W), 1633 m, 16 July (JLE 3871); Rancho El Virulento (28°45′40.9″N, 104°20′8.5″W), 1500 m, 10 July (JLE 4087); near Lomas El Berrendo (29°43′23.9″N, 105°19′30.9″W), 1600 m, 31 August–1 September (JLE 4297, 4409); Entronque La Perla (28°17′59.8″N, 104°33′5.0″W), 1600 m, 4 September (JLE 4410).

Thamnophis c. cyrtopsis (Kennicott), Western Blackneck Garter Snake. Seven specimens are in the collection. One (JLE 3905) is from northwestern Chihuahua, 5 km W km 60 on the highway between Janos and Agua Prieta (31°15′54.2″N, 108°36′32.5″W), 1520 m, 20 July. All of the others are from extreme eastern central Chihuahua: five (JLE 3785, 3792-5) from Ojo del Carrizo (29°58′27.5″N, 105°15′45.8″W), 1459 m, 12 July, and one (JLE 3897) from Polvorillas (=Piedras Encimadas) (28°47′36.2″N, 104°13′30.8″W), 1440 m., 7 July. All have 19-19-17 scale rows and 1-1 preoculars. All have 8-8 supralabials except for two males with 7-8; all have the 4th and 5th supralabials entering the orbit except one with 3rd and 4th; all have 11-11 infralabials except 3905 with 12-12; all have 3-3 postoculars except one male with 2-3; temporals 1-2-3 on 10 sides, 1-2-4 on three sides, and 1-3-3 on one side; ventrals 169–173 in four males, 164–171 in three females; subcaudals 66+, 86(2) and 91+? in males, 77, 78 and 79 in females; the umbilicus is located at ventrals 152–3 in one male, at ventrals 144–6 and 149 in two females. Total lengths vary from 282 mm to 545+ mm; the umbilicus is visible only on the three smallest specimens, 282–317 mm TTL.

These localities all fall (barely) within the range for the subspecies depicted by Rossman et al. (1996), and for the most part the scale data also conform with the parameters stated in that work. The only notable discrepancy is that the infralabials are normally 10, rarely 9 or 11, whereas all of these specimens had 11 or (one specimen) 12. Perhaps a difference in method of counting is responsible for the difference in counts obtained.

Thamnophis m. marcianus (Baird and Girard), Marcy's Checkered Garter Snake. Five specimens were obtained, all in extreme eastern central Chihuahua and well within the range depicted in Rossman et al. (1996). One (JLE 3796) was taken at Ojo del Carrizo (29°58′27.5″N, 105°15′45.8″W), 1459 m, 12 July; one (JLE 3898) at Polvorillos (=Piedras Encimadas) (28°47′36.2″N, 104°13′30.8″W), 1440 m, 7 July; and three (JLE 4201-3) from Río San Carlos, Sierra Azul (29°6′52.5″N, 103°55′37.6″W), 1200 m, 27 August. All have 21-21-17 scale rows, 8-8 supralabials with 4th and 5th entering orbit, and 1-1 preoculars. The infralabials are 10-10 in three, 10-11 in one,

and 9-10 in one; the postoculars are 4-4 in three, 2-3 in one, 3-4 in one; temporals 1-2-3 in three, 1-3-4 in two; the ventrals are 158–165 in three males, 153 in both females; the subcaudals are 74(2) and 79 in the males, 68 in the one female with a complete tail; the umbilicus is at ventral 137 in one female, at 147–9 in one male; the series varies in TTL from 330 to 522 mm. All variation falls within the limits described in Rossman et al. (1996).

Crotalus atrox Baird and Girard, Western Diamondback Rattlesnake. Six specimens were taken; one (JLE 4218) was headless, from km 20 on the Coyame–El Carrizo road (29°35′40.1″N, 105°13′30.0″W), 1470 m, 28 August, and no data were taken on it. The other five were all from the same general area in extreme eastern central Chihuahua, as follows. Ejido Ojo del Carrizo (29°58′27.5″N, 105°15″45.8″W), 1459 m, 13 July (JLE 3800); km 22.3 on the Coyame–Ojo del Carrizo rd (29°35′46.4″N, 105°14′45.2″W), 1470 m, 12 July (JLE 3799); 6 km NE jct rd to Santa Anita and the Coyame–Ojo del Carrizo rd (29°40′16.3″N, 105°18′1.7″W), 1580 m, 31 August (JLE 4295); Polvorillas (=Piedras Encimadas) (28°47′36.2″N, 104°13′30.8″W), 1440 m, 7 July (JLE 3797); and Ejido Venustiano Carranza (28°21′29.3″N, 104°31′53.2″W), 1499 m, 4 July (JLE 3874).

The data on the five intact specimens more or less conform with the data given in Klauber (1930: 22). Falling in the one per cent category, however, is No. 3797 with only 23 midbody scale rows; all others have the usual 25 or 27. The same individual has 23 anterior scale rows (the others 25 or 26), and 20 posterior scale rows (the others all 21). These specimens also all fall in the very low range in number of ventrals: 172, 173 and 175 in males, 177 and 179 in females; indeed, 172 is lower than Klauber's (1930: 24) minimum for males. The umbilicus in the smallest individual (290 mm TTL) is at ventrals 160–2. The subcaudals are normal, 20 and 22 in two females, 25, 26 and 27 in the males; the terminal one (1), two (2), five (1) or six (1) are divided. Supralabials 15-16 in four, 14-15 in one; infralabials 15-16 in one, 16-17 in three, 17-17 in one; first infralabial divided in one, entire in others; loreals 2-2 in two, 1-1 in three; minimal intersupraoculars 5 in all; prenasal contacting first supralabial in all; postnasal contacting preocular in two, separated in three; 32, 35(3) and 37 body blotches; tail rings 3 and 4-5 in the females, 4-5, 5-6 and 6-6 in the males; button only on rattle in the smallest individual; 2 segments and button in one at 357 mm TTL; 5 segments and button at 645 mm and 693 mm TTL; and 7 segments and button at 862 mm TTL.

Crotalus l. lepidus (Kennicott), Mottled Rock Rattlesnake. A single specimen of this taxon (JLE 3896) is from the mountain near La Perla (=El Berrendo) (28°17′59.8″N, 104°33′5.0″W), 1684 m, found coiled in a candelilla bush (*Euphorbia syphylitica*) at 16:14 hrs, 4 July. Although Klauber (1972: 41, 62) stated that this subspecies occurs in the state of Chihuahua, and maps its range in the extreme eastern corner of the state, we are aware of no actual records of occurrence other than the present, although certainly it was to be expected.

The specimen is an adult male, 592 mm TTL, 49 mm TL, with 23-23-17 scale rows, 158 ventrals, 26 subcaudals (only the terminal one divided), 13-13 supralabials, 12-12 infralabials (first not divided), three intersupraocular scales, upper preocular divided, 15 transverse bars on body, 3 on tail. It agrees in all features with the diagnostic characters of the subspecies, having a distinct dark postorbital line, separated nuchal spots, venter relatively dark, intercalary markings between dorsal rings present although faint, and a reddish brown ground color. We do not regard it as an intergrade with *C. l. klauberi*.

Crotalus lepidus klauberi Gloyd, Banded Rock Rattlesnake. A single specimen (JLE 3798) is from 1 km E Coyame on San Pedro rd (29°26′14.2″N, 105°4′31.0″W), 1294 m, 11 July. This record extends the known range of the subspecies a bit farther east than shown in Klauber (1972: 62). It is latitudinally only about 55 km west of the locality cited above for *C. l. lepidus*, although about 185 km NNWN thereof.

The specimen is a male, 407 mm TTL, 37 mm TL, with 23-23-17 scale rows, 155 ventrals, 25 subcaudals (only the terminal one divided), 12-12 supralabials, 11-12 infralabials (first not divided), three intersupraocular scales, upper preocular divided, 16 transverse bars on body, 2 on tail. It agrees in all features with the diagnostic characters of the subspecies, having no postorbital dark line whatever, no distinguishable nuchal spots, venter relatively light, no intercalary marking between dorsal rings whatever, and a greenish-gray ground color. We do not interpret it as an intergrade with *C. l. lepidus*, despite the close approximation of the ranges of the two subspecies in this area.

Crotalus molossus molossus Baird and Girard, Blacktail Rattlesnake. A single adult male (JLE 4086), 943 mm TTL, 65 mm TL, was taken 4 July near La Perla (=El Berrendo) (28°17′52.9″N, 104°33′10.9″W), 1633 m, with 8 rattle segments but no button. Its scale rows are 29-27-18, ventrals 180, subcaudals 26 (the terminal two divided), supralabials 15-18, infralabials 17-18, a minimum of 4 scales in a row between supraoculars, and 36 blotches in the body. The tail is solid black above. The body blotches are typical, open on the sides and reaching to near the venter. The low number of posterior scale rows (18) is exceptional (less than 1% according to Gloyd, 1940: 158).

This is the first specimen to be recorded from the large area in eastern Chihuahua whence Gloyd (1940: 155) mapped no localities for the subspecies.

Crotalus molossus nigrescens Gloyd, Mexican Blacktail Rattlesnake. A single adult female (JLE 4051), measuring 988 mm TTL, 52 mm TL, was taken 27 July near Puerto Justo, municipio of San Francisco del Oro (26°48′45.9″N, 106°0.0′53.7″W), 2275 m. It conforms with the diagnostic criteria of the subspecies in both scalation and pattern. The scale rows are 29-25-21, ventrals 186, subcaudals 23 (terminal two divided), 14-17 supralabials, 15-18 infralabials, 2-2 loreals. The pattern consists mostly of closed rhombs, sharply different from the open crossbands in the nominotypical subspecies.

However, the specimen is unusual in a number of respects. There is only a single, tiny canthal on each side, so there is a broad contact of prefrontal and upper preocular. Posterior to

the prefrontals is one large scale contacting the supraocular on each side. A parietal, several times the size of adjacent scales, borders the supraocular posteriorly, and the latter two are separated by a minimum of two scales in one row. The number of ventrals matches the maximum given by Gloyd (1940: 166) for the subspecies; the 14 supralabials is matched by only 4% of the specimens he examined; and the number of infralabials is matched by only 8% (15) and 11% (18).

There is no evidence that this specimen represents intergrade populations between *C. m. molossus* and *C. m. nigrescens*, which according to Tanner's (1985: 662) evidence presumably occur somewhere between the vicinity of Guachochi and Puerto Justo.

Crotalus p. pricei Van Denburgh, Price's Twin-spotted Rattlesnake. A single adult female (JLE 3950) was found basking against a pine log 8.1 mi S Creel, on the detour to Caba–as Batosarachi (27°42′6.9″N, 107°35′6.1″W), 2200 m, 23 July. On 26 July six young were born (J:E 4080-5). The locality is in the middle of the known range of the subspecies (Klauber, 1972: 63).

The adult is 509 mm TTL, 37 mm TL, rattle with seven segments and no button. The most notable deviation from descriptions of the subspecies is that most pairs of the dorsal blotches are fused; only 4 pairs on the female are not fused, 5 on each of three neonates, 7 on one, 9 on one, and 35 on one. Klauber (1952: 42) noted that most specimens have fewer than half of the normally paired spots conjoined, and that "very few" have almost all fused.

The adult is also very dark, to the extent that it is impossible to distinguish the dorsal blotches clearly. They are clearly evident in the neonates, but those snakes too are darker than normal. Another abnormality is the occurrence of 19 midbody scale rows in one (JLE 4083), although neither Gloyd (1940) nor Klauber (1952) record any with that few. Likewise, the posterior scale rows are exceptionally frequently reduced to l6 (2) or 15(2), whereas Gloyd (1940: 100) recorded only 25% with 16, 8% with 15. Otherwise the scale rows in all seven are normal, 21-21-17. The anterior subocular contacts the 4th or 5th supralabial on one side only of three neonates, but on all other sides one or more small scales intervene.

Of special interest for comparative purposes is the position of the umbilicus in the neonates. It is exceptionally far to the rear, only 13–17 scales from the anal. In the four males the total ventrals and the ventral(s) with the umbilicus (in parentheses) are 154.5(140–1), 155(140–1), 154(137–8), 155.5(139), and in the females 158(145), 160(145).

Otherwise the scalation of all seven is normal: subcaudals 20–22 in females, 26–27 in males; 1–5 rear subcaudals divided; supralabials 8 on one side, 10 on two sides, 9 in all others; infralabials 10 on 9 sides, ll on 5; a minimum of 2(2) or 3(5) scales in a row between supraoculars. The males vary in TTL 165–175 mm, the females 163–169 mm; the TL varies 15–16 mm in males, 12 mm in females.

Crotalus s. scutulatus (Kennicott), Mojave Rattlesnake. Thirteen specimens suggest that this may well be the most common, widely distributed species of snake in the state. They are as follows. JLE 3840, Lomas El Berrendo, km 42 on the Coyame–El Carrizo road (29°42′16.5″N, 105°19′34.9″W), 1633 m, 13 July; JLE 3846, km 38 on the same road as 3840, 15 July; JLE 3849-50, same as 3840, 16 July; JLE 4035 (headless), 4050, crop field 800 m from gas station at Balleza (26°55″48.3″N, 106°20′57.3″W), 1638 m, 27 July; JLE 4159 (smashed DOR), km 12, Camargo–Ojinaga rd (27°41′19.7″N, 104°57′3.1″W), 1380 m, 27 August; JLE 4224, grassland between Rancho La Paloma and Rancho El John (29°47′55.6″N, 105°21′43.7W), 1570 m, 29 August; JLE 4295, 6.0 km NE jct road to Santa Anita and the Coyame–El Carrizo road (29°40′18.7″N, 105°18′1.7″W), 1580 m, 31 August; JLE 4296, 4.0 km NE same jct (29°40′16.3″N, 105°17′6.9″W), 1580 m, 31 August; JLE 4300, 4325, Cerros Santa Anita (29°40′14.1″N, 105°19′13.6″W), 1490 m, 1 September; JLE 4407 (smashed DOR), Llano los Gigantes, Camargo–Ojinaga rd (28°3′3.2″W, 104°37′1.5″W), 1410 m, 4 September.

Six males have 165–174 ventrals and 24–26 subcaudals; the four females have 170–176 ventrals, and five have 18–19 subcaudals. Two to five terminal caudal rings are black. The internasal-prefrontal scales are usually 8(6), but 11(2) and 12(1) occur. One anterior pair of scales lies between the supraoculars, and in 7 of 9 a posterior pair does the same; in two the posterior row contains 3 scales. The lower preocular is divided in one. The scale rows are 23-25-19 in 8, 25-27-19 in 3. The umbilicus is at ventrals 155–7 in a 377 mm (TTL) female, and at ventrals 158–161 in a 397 mm female. A parietal, about 2–3 times the size of adjacent scales posteriorly and medially, borders the supraocular posteriorly. The largest male measured 954 mm TTL, tail 73 mm; the largest female was probably in the 500 mm range but headless, with a 39 mm tail.

The localities represented all fall within the range depicted by Price (1982), whose map shows an interesting hiatus of records across southern Chihuahua and northern Coahuila. There are ample records for central and northern Chihuahua, as well as the extreme southern edge of the state, but none between.

Acknowledgments

We are much indebted to Rozanne Humphrey, collections manager, and Drs. Shi Kuei Wu and Alan DeQueiroz of the University of Colorado Museum, and to Dr. Robert Eaton, chairman of the Department of EPO Biology of the University of Colorado, for facilities essential for this study.

Literature Cited

Campbell, J. A., and W. W. Lamar. 1989. The venomous reptiles of Latin America. Ithaca, NY: Cornell Univ.

Camper, J. D. 1996. *Masticophis taeniatus*. Cat. Am. Amph. Rept. (639):1-6.

Camper, J. D., and J. R. Dixon. 1994. Geographic variation and systematics of the striped whipsnakes (*Masticophis taeniatus* complex: Reptilia: Serpentes: Colubridae). Ann. Carnegie Mus. 63:1-48.

Dixon, J. R., and R. H. Dean. 1986. Status of the southern populations of the night snake (*Hypsiglena*: Colubridae) exclusive of California and Baja California. Southwestern Naturalist 31:307-318.

Domínguez, P., T. Alvarez and P. Huerta. 1977. Colección de anfibios y reptiles del noroeste de Chihuahua Mexico. Revta. Soc. Mex. Hist. Nat. 35:117-142 (for 1974).

Gloyd, H. K. 1940. The rattlesnakes, genera *Sistrurus* and *Crotalus*. Spec. Publ. Chicago Acad. Sci. (4):i-vii, 1-270.

Goyenechea Mayer-Goyenechea, I. 1995. Revisión taxonómica de los géneros *Conopsis* Günther y *Toluca* Kennicott (Reptilia: Colubridae). Master's Thesis, UNAM, México.

Klauber, L. M. 1930. Differential characteristics of southwestern rattlesnakes allied to *Crotalus atrox*. Bull. Zool. Soc. San Diego (6): 1-71.

————. 1952. Taxonomic studies of the rattlesnakes of mainland Mexico. Bull. Zool. Soc. San Diego (26): 1-143.

————. 1972. Rattlesnakes: Their habits, life histories and influences on mankind, Vols. I and II, 2nd Edition. Berkeley, CA: University of California Press.

Lazcano, D. 1988. Life history notes: *Heterodon nasicus kennerlyi* coloration. Herpetological Review 19:36.

Liner, E. A. 1994. Scientific and common names for the amphibians and reptiles of Mexico in English and Spanish. Soc. Study Amph. Rept. Herp. Circ. 23.

Platt, D. R. 1969. Natural history of the hognose snakes *Heterodon platyrhinos* and *Heterodon nasicus*. Univ. Kansas Publ. Mus. Nat. Hist. 18:253-420.

Price, A. H. 1982. *Crotalus scutulatus*. Cat. Am. Amph. Rept. (291): 1-2.

Rossman, D. A., N. B. Ford and R. A. Seigel. 1996. The garter snakes: Evolution and ecology. Norman, Oklahoma, Univ. Oklahoma.

Smith, H. M. 1943. Summary of the collections of snakes and crocodilians made in Mexico under the Walter Rathbone Bacon raveling Scholarship. Proc. U. S. Nat. Mus. 93:393-504.

Smith, H. M., G. J. Watkins-Colwell, J. A. Lemos-Espinal and D. Chiszar. 1997. A new subspecies of the lizard *Sceloporus scalaris* (Reptilia: Sauria: Phrynosomatidae) from the Sierra Madre Occidental of Mexico. SW Naturalist 42: 290-301.

Tanner, W. W. 1961. A new subspecies of *Conopsis nasus* from Chihuahua, Mexico. Herpetologica 17: 13-18.

————. 1985. Snakes of western Chihuahua. Great Basin Naturalist 45: 615-676.

Taylor, E. H., and H. M. Smith. 1942. The snake genera *Conopsis* and *Toluca*. Univ. Kansas Sci. Bull. 28: 325-363.

Walley, H. D., and C. M. Eckerman. 1999. *Heterodon nasicus*. Cat. Am. Amph. Rept. (698):1-10.

Webb, R. G. 1984. Herpetogeography in the Mazatlán-Durango region of the Sierra Madre Occidental, Mexico. Pp. 217-241. *In*: Seigel, R. A., L. E. Hunt, J. L. Knight, L. Malaret and N. L. Zuschlag, eds. Vertebrate ecology and systematics: a tribute to Henry S. Fitch. Univ. Kansas Mus. Nat. Hist. Spec. Publ. (10): i-viii, 1-278.

————. 1990. Description of a new subspecies of *Bogertophis subocularis* (Brown) from northern Mexico (Serpentes: Colubridae). Texas J. Science 42: 227-243.

Wilson, L. D. 1970. The coachwhip snake, *Masticophis flagellum* (Shaw): Taxonomy and distribution. Tulane Studies Zool. Bot. 16: 31-99.

————. 1973. *Masticophis flagellum*. Cat. Am. Amph. Rept. (145): 1-4.

Bull. Chicago Herp. Soc. 35(2):25-27, 2000

The Annamese Flying Frog

Evgeny Ryboltovsky
Curator, Laboratory of Practical Herpetology
Children's Zoo
1-liniya 38, Vsevolozhsk
Leningradskaya obl. 188710
RUSSIA
E-mail: herplab@ryboltowsk.spb.su

This article has been reprinted with permission from *International Zoo News* 46(7):392-397 (1999).

When searching for information on some amphibians and reptiles native to Southeast Asia, one often faces great problems because the data are scattered in different, frequently unusual, books or articles, or merely mentioned in some published material. There are excellent works on the fauna of Australia and the Americas, Madagascar and the Seychelles, but, as far as I am aware, we are still not in possession of comprehensive descriptions of the batracho- and herpetofauna of Southeast Asia. This is, I believe, the result not of any lack of interest in the region, nor even of the inaccessibility of many areas, but, first of all, of the political situation in many countries of Asia: some of them—such as Cambodia—have long been in a state of martial law, and others—such as Nepal—permit foreign citizens to move away from the tourist centers only with great reluctance. This is fully true of Vietnam. Prolonged wars, followed by a rigid political regime, have long offered no means of proceeding with field studies. Visits of Soviet specialists to Vietnam were generally merely "friendly" in nature, and based on political rather than scientific principles.

After Bourret's (1942) studies, which are clearly incomplete because of the absence at that time of appropriate equipment suitable for operating under tropical conditions, serious research on the herpetofauna of Vietnam was only resumed as recently as 1993, when the political situation in the country relaxed somewhat and sudden discoveries rained down on biologists. When it is considered that two ungulate species classified in a new *genus*(!), *Pseudoryx*, were found in Vietnam in 1992 and 1994, what might be said about such secretive and, in a sense, minor creatures as amphibians and reptiles? And the researchers were generally familiar with no more than the names and type specimens of the species earlier described by the French scientists! This is especially true of amphibians, which for the most part lead a nocturnal life. As a rule, their biology remains unknown, information on the keeping of many species in captivity is not available, and not only amateurs but even serious specialists are often astounded when they see a photo of some amphibian which they know by its name only. This holds true for many species of the family Rhacophoridae, which includes many tree frogs dwelling in South-East Asia.

The family Rhacophoridae contains ten genera, seven of which occur throughout Southeast Asia: many of its species are well-known, studied and represented in captivity. Flying frogs of the genus *Rhacophorus*, some large specimens of which were vividly described even by Brehm, command the attention of terrarium keepers. The poorly-known *Rhacophorus annamensis*, which is probably an endemic of the mountain forests of southern Vietnam, is one of the larger-sized representatives of the genus. The frog is usually light grey in color, though brown and even dark red specimens are met with as well. The females can be as large as 10 or 11 cm, and the males are somewhat smaller. As in all other representatives of the genus, both the hind and front feet of these frogs are webbed; the webs, in some cases colored bright yellow, allow the amphibians to make gliding jumps. Their fingers and toes are provided with large suckers. When jumping, the frog spreads wide its fingers and toes, and stretches the webs, thus increasing their area; according to my observations, this allows

Annamese flying frogs (*Rhacophorus annamensis*) in amplexus.

An adult male Annamese flying frog.

a frog to glide for 10 to 15 meters, though some authors indicate that other species of the genus can jump for a distance of 20 and even 30 meters.

We observed *R. annamensis* in the area of the village of Buoenluoi (about 50 km from the town of An Khe), on the Taen Gue plateau in the central highlands of southern Vietnam, at a height of 1,100 to 1,300 meters above sea level. Frogs of this species are very abundant there, though outside the mating season one might think that they are extremely uncommon. For example, from October to December 1993, only three (1.2) specimens were found, whereas in April and May 1995 as many as 50 specimens were sometimes encountered during a three- to four-hour excursion.

When the frogs assemble at their mating sites, they concentrate near mountain streams, where they spawn over pits of stagnant water on the stream sides. Like other specimens of the genus *Rhacophorus*, *R. annamensis* spawn not into water but into foam nests, which the females beat up from mucus excreted from their skin and attach to stones, tree-trunks or, less commonly, branches above the water. Lesser numbers of spawning *R. annamensis* can be found at shaded forest pools or small lakes, where it is much more interesting to watch them and observe their behavior; to get to the shallow pits near the mountain streams, the frogs use branches and make their way there separately, but at the pools the females, with the males sitting tightly on their backs, jump in from the tree tops, making a big splash, and then hurry to the bank and start making

A female Annamese flying frog on her foam nest.

A young Annamese flying frog after metamorphosis.

nests at suitable places. During the entire process of nest-making, the male stays on the female's back, but remains passive until spawning begins. The frogs spawn directly into the foam, and the nests hold their shape for some days; then they lose their cohesion and flow down into the water, together with the tadpoles, which have hatched by that time.

In May 1995, eight pairs of adult *R. annamensis* were caught to be kept in captivity. Unfortunately, the efforts taken to help them to endure the long journey were not very successful – only four males and two females survived, and even these were in a rather poor state when they arrived at their destination. First we had to resort to forced feeding and to heal their sores. The amphibians were placed in a large glass terrarium with tree branches installed in it. Temperature was maintained at 24 to 26°C by day and 20 to 22°C by night. In addition, a lamp located above one of the branches was switched on by day; this ensured local heating of a small site at up to 32°C, and the frogs, particularly the females, spent much of their time there. Having habituated to the terrarium, the animals proved to be surprisingly relaxed. Unlike some other species – such as, for instance, *Polypedates leucomystax* — which, when even slightly bothered, make sudden hysterical jumps and often smash into the walls of the terrarium, *R. annamensis* do not respond to movements outside the terrarium, and even allow themselves to be picked up. There was no water area in the terrarium, but lavish spraying took place twice a day, after which the frogs started to move across the sides of the terrarium and flapped their spread webs on the glass, thus gathering the water. When the frogs began to eat, they readily took crickets and big cockroaches, and the females even ate young mice. Circadian color variations were observed, the nocturnal color being much lighter than the diurnal, sometimes even light yellow.

Until December 1995, the frogs ate actively and grew much fatter, and all their sores healed without even leaving any scars. In December the temperature was reduced to 22 to 24°C by day and 16 to 18°C by night, and the local heating was switched off. Spraying was reduced to a single moderate application each day. In winter the frogs were inactive: they

spent much time sticking to the glass in the corners of the terrarium and practically refused to eat. At the end of February 1996, the temperature was gradually increased up to the summer values, and the amphibians were moved to a smaller vertical terrarium whose entire bottom (45 × 45 cm in area) was occupied by a 10 cm deep water basin. Spraying was replaced by two ten-minute sprinklings. On 2 March, the day after they were transferred to the new terrarium, the frogs started eating, and in the evening they actively moved across the walls of the terrarium. On 4 March two males took up strategic positions on the branches and, with the advent of darkness, started uttering cries resembling sharp laughter; by the next day they were calling almost continuously, sometimes making attempts to mount the females, who were growing much fatter. On 7 March one pair came into a close amplexus; the female was restless, moved across the terrarium and began to make a foam nest on the night of 8 March. She chose a site on the glass wall of the terrarium, attached herself to it firmly by her front feet and, bending, started first to pass her hind feet over her sides and then to rub them against one another. A mass of white foam started to emerge from under her webs and stick to the glass. The male, who sat on the female during the entire process of nest making, behaved passively, occasionally making slight movements to attach himself more firmly and uttering low cries. When the nest was as large as 15 × 15 × 15 cm, spawning commenced. The female laid big (ca. 3 mm) pale yellow eggs one by one, while the male used the folded webs of his hind feet to catch and fertilize each one, afterwards unfolding his feet and pressing the egg down into the foam. Meanwhile the female used her hind feet to pat the foam back into shape. Interestingly, the spawning was of short duration, and the pair soon left the nest and split up. During the night and throughout the next day the female periodically returned to the nest, patted it with the webs of her hind feet, and sometimes laid additional eggs; the male did not take part in this process. Moreover, the same day the second female started laying; she used the same nest and approached it to lay several times, not always while in amplexus with the male!

Thus, the two females spawned in the same nest. The absence of infertile eggs suggests that the males fertilize not the eggs but the foam of the nest, and that the sperm survives there for an appreciable length of time, thus enabling the females to complete spawning without the males. Within a few hours of the completion of spawning, the surface of the nest dried out a little, forming a slight crust and ceasing to be sticky, so that it began to feel like soft foam rubber.

On 11 March, almost white tadpoles could already be seen moving in the foam; and on 14 March, when the terrarium was being sprayed, the nest lost its shape and flowed down into the water. Some of the tadpoles, which were light grey in color, about 1.5 cm in length and bearing big yolk sacs, swam out in different directions at once, while the rest stayed in the floating foam, which they left in the course of the next two days. A total of 50 tadpoles emerged, and they soon began to swim, though they spent much of their time on the bottom of the water basin. They were transferred to a larger aquarium, where they ate various animal feed (meat, fish, liver, egg) and grew up quickly. They had strong tails and seemed to feel comfortable in the 50 cm deep basin; they would rise rapidly to the surface to inhale air and immediately sink back into the water. During the third month of their life, the tadpoles reached 6 cm in length and their hind feet emerged. As a whole, their development lasts for three-and-a-half or four months, after which the young amphibians leave the water, climbing up the walls of the aquarium. The young frogs are 1.2 to 1.4 cm in size. Of interest is the juvenile coloration – they are light grey, almost white, in color, with many large black spots. When they lose their tails, young *R. annamensis* frogs start to eat house flies and adult crickets.

At first glance one might think that the breeding of this species involves no great problems. However, it seems that the frogs may be hypersensitive to vitamin and mineral deficiency. Even when their food was enriched with vitamin and calcium supplements of Russian manufacture, progressive paralysis started to develop in the juveniles, and within only four months the entire hatch was lost. Fortunately, the adults became ready for reproduction again during the summer, and on 1 and 2 September both females spawned. This time the spawning took place in a large terrarium (160 × 60 × 40 cm), and each female made her own nest. Thus, when the loss of the spring-hatched juveniles started, about 100 new tadpoles had already left their nests. Vitamin-rich feed produced by Tetra GmbH, intended for fish, was introduced into their diet; and other preparations manufactured by the same company, intended for reptiles, had been received by the time of metamorphosis. Thanks to the plentiful use of the product Reptical we managed to keep 25 juveniles alive for six months, by the end of which time they had reached 3 cm in length. Their coloration changed to grey or light brown, and the spots, though they had become less contrasting, were still visible.

Unfortunately, it is too early to speak in terms of a major advance in the captive reproduction of these amphibians. However, our experience to date in keeping and breeding the species gives good reason to hope that all aspects of work with this flying frog from southern Vietnam will eventually be mastered.

Reference

Bourret, R. 1942. Les Batraciens de L'Indochine. Transactions of the Oceanographic Institute of Indochina, No. 6. [In French.]

Bull. Chicago Herp. Soc. 35(2):28-29, 2000

Chicago Wilderness Frog Surveys—Get Involved, Herpers!

Bill Leja
1634 W. Chase
Chicago, IL 60626
Telephone: (773) 465-2122
E-mail: wleja@mindspring.com

The Chicago Wilderness people have been trying to turn a dream into reality for some time. That dream is to restore the habitats of the native plants and animals of the Chicago Area so that all of these species remain a part of our local heritage. In the last decade this region has established well-respected volunteer monitoring networks for birds and butterflies. It's time now to begin to do the same for amphibians and reptiles, and an important first step in that direction is underway. We expect that—with the wealth of interested people and the modest but important resources that Chicago Wilderness can provide—this spring's surveys of calling frogs and toads is the start of a permanent project that may outlive us all. Interest in wildlife conservation in the area is strong and growing, so we expect to have impressive numbers of great volunteers once the word is out. This project—part of the larger effort involving birds, butterflies, plants, and other groups and called the Habitat Project—will be based out of the Chicago Wilderness Audubon offices in Skokie.

Chicago Wilderness is drafting a comprehensive plan for amphibian conservation for the region. It will be reviewed by herpetologists, land managers, survey volunteers and others, with the goal of a finished draft for publication this year. A key early step of this plan will be the monitoring of frog populations by volunteers. We need to know where the breeding sites are and what species are using each site. Some of the important questions many people are wondering about that may be answered in time through this project and related professional studies are: What effect do prairie and savanna restoration activities have on frog populations? Are some breeding sites degraded, and if so how can they be restored? Can frogs cross roads and other barriers successfully in order to migrate to other breeding sites? What role do ditches and streams play in promoting movement through the region? Can habitat be improved in some areas so that cricket frogs will return on their own? It is anticipated that the interest generated by this project will draw popular attention to amphibians and result in more funding for the many research questions that will need professional study.

The Frog Monitoring Project is designed so that the public can participate meaningfully as volunteer monitors or as county coordinators. The Habitat Project organizers are trying to maximize the opportunity for independence and initiative at the county level, and hope that people will contribute their energy and good ideas along the way to help make the overall project a success.

Herpetologist Russ Hendricks, who has coordinated a Frog Monitoring Project for three years in Lake County, Illinois, will play a key leadership role in the startup of the Habitat Project's effort. The Lake County Frog Monitoring Project was started in 1995 by Michael Redmer as a pilot study. The goals were to familarize volunteers with the local frogs, to collect baseline data on their location, and to assess the reliability and efficiency of volunteer participation in a frog and toad monitoring protocol. Lynn Hepler was the county coordinator for 1995, Tom Smith for 1996 and Russ Hendricks since 1997. Those volunteers who have been with the program since the beginning deserve mention: Joyce Proper, Jim Johnson, Joan Palincsar, Greg Carlson and Susan Tripp.

Who Will Be Working with the Volunteer Monitors?

Each county will have a **County Coordinator** who will know after the project has been going for several years where the breeding sites that are most important for future conservation projects are located; however, the coordinator is not expected to be driving around locating sites and evaluating them. That knowledge will build gradually on the basis of input from herpetologists or ecologists who live in the county and have an interest in the conservation of the local amphibians. The coordinator is not expected to assign sites to volunteers until a clear picture emerges of which sites are of greatest interest; so initially the choice of which sites to survey is mainly up to the volunteer. However, once the monitoring of a site starts it is best to continue monitoring there even if a new volunteer has to take over—assuming it is considered to be an important site. In time the county coordinators will have the experience necessary to see that there is continual monitoring of the sites that are most worth monitoring. Because volunteers will play a key role initially in choosing sites, some sites may be monitored by several people; however, that can be an advantage because it reduces the chance of missing data from that site. Ideally, each site should be monitored every year. The coordinator will collect completed data forms from the volunteers each year when the monitoring is over and mail a copy of each to the Habitat Project. (In turn, the Habitat Project will distribute the data to county and state conservation agencies, interested members of the Chicago Wilderness Science Team, and others as appropriate. Data on rare species will sometimes be withheld from people without a legitimate need for it.)

As the reader will see, the role of county coordinator can be performed by anyone who likes working with people, has a little time to start the ball rolling each spring with help from Chicago Wilderness, and is enthusiastic about the project and its ultimate goals.

How Will the Volunteer Monitors Learn What to Do?

The Habitat Project is organizing **Workshops** where local experts will talk about the local frogs and toads, explain how to conduct a survey, and play tapes so that the monitor can connect the sound with the species. There are only a dozen

species in the area, and on a particular evening at a particular site only a few will be calling, so it will be easy to identify them. In a given month only some of the species will be calling, and the monitor will know in advance which species are expected. All of the data collected by each volunteer monitor in a season will fit on a single sheet of paper—a form to be provided by the coordinator.

How Much Time Is Required of a Volunteer Monitor?

The monitor will need to spend 15 minutes at most at each site listening and recording data. Since we're recommending that each volunteer monitor a group of five sites, most people will spend about one hour total at the sites, and maybe another hour driving. This will be done on three spring evenings (early, mid, and late spring) so that early, middle and late spring breeders will be heard and recorded.

What If I Only Want to Monitor One or Two Sites?

That's fine; we'll accept you into the program. We're eager to get all the data and sites that we can. We respect volunteers who limit what they take on.

Is There a Web Site Where I Can Learn More about This?

The North American Amphibian Monitoring Project (NAAMP) has a web site where you can download the national standard protocol for frog call monitoring: http://www.im.nbs.gov/amphibs.html. However, you will notice that they have an entirely different method of selecting survey routes. Their method won't work here because breeding sites are mostly clumped in preserves rather than randomly distributed throughout the landscape. The Habitat Project will use the protocol already in place in Lake County, Illinois, and data will be shared at the national level. The web site has a page that provides information on where you can purchase tapes of frog calls, and it is a good idea to buy the one in use in Lake County. There is also a procedure on the web site for salamander monitoring; but it probably will not work here because five of the local salamanders are mole salamanders (amby-stomatids), and like moles they spend a good deal of time underground.

Can Sites on Private Property Be Monitored?

Yes. At each site you simply park and listen. Of course it is always best in you can secure the support of the landowner, but there is no need to actually enter the property, since most calls can be heard from some distance. At a later stage of the project, conservation efforts may be recommended for a given site. In such cases, of course, the landowner is the decision-maker. Thus participation by (or at least good communication with) land managers is crucial.

Where and When Will the Workshops Be Held?

Four, or possibly five, workshops will be held in March. You do *not* have to live in the county where the workshop is held to attend:

Lake County, Illinois

Lake County Forest Preserve District Headquarters, 2000 N. Milwaukee Avenue, Libertyville, IL.

9:00 A.M. to 12:00 noon on March 11.

Call Russ Hendricks at (262) 843-3648 for further information.

This workshop will be led by herpetologists Russ Hendricks, Ellin Beltz and Ken Mierzwa. Thanks to Russ, the Lake County calling frog surveys have been up and running for several years now.

Kane County, Illinois

Pottawatomie Community Center in St. Charles.

9:00 A.M. to 12:00 noon on March 18.

This workshop will be led by herpetologist Ken Mierzwa.

Call Mary Ochsenschlager, (630) 513-3338, at the St. Charles Park District or Day Waterman of the Fox Valley Land Foundation at (847) 697-5503 for further information.

Cook County, Illinois

Camp Sagawau; a quarter-mile east of the intersection of Archer Avenue and Illinois Route 83, on the north side of Route 83.

1:00 P.M. to 4:00 P.M. on March 25.

It is uncertain at this time who will lead this workshop.

Porter County, Indiana

Indiana Dunes National Lakeshore

Date and time not established yet. Call (847) 965-9239 for recorded information or Ralph Grundel, (219) 926-7561, X422, at the Indiana Dunes National Lakeshore for more information.

This workshop will be led by herpetologist Spencer Cortwright of Indiana University in Gary.

How Can I Learn More about Volunteer Needs and Opportunities?

A recorded message at (847) 965-9238 gives information about workshops, how to contact county coordinators, a list of unfilled county positions, answers to most frequently asked questions, and other information.

How Can I Contact the Chicago Wilderness Habitat Project?

Call Rickie White (847) 965-1150. He will be able to answer your question or refer you appropriately.

Who Is Reviewing and Supervising This Project?

The protocol we are using for monitoring frog calls is that of the existing Lake County project and was drafted by Russ Hendricks, Ken Mierzwa, and others. The Amphibian Conservation Plan will be reviewed by the Chicago Wilderness Science Team and by a wide array of conservation herpetologists. A start-up steering committee to oversee the frog surveys is chaired by Bill Leja and Russ Hendricks and includes Ken Mierzwa, Rickie White, and Steve Packard.

Bull. Chicago Herp. Soc. 35(2):30-32, 2000

HerPET-POURRI

by Ellin Beltz

Busted down under

"Customs officers in Western Australia have arrested a German over the alleged attempted export of more than 80 native snakes and lizards. [The] Justice and Customs Minister . . . said the 36-year-old man was arrested at Geraldton on Christmas Eve as he tried to send 59 skinks by post to Germany. She noted skinks are a species of Australian lizard native to the Pilbara and Murchison regions of Western Australia. . . . Further investigations and a search of a vehicle led to an assortment of 27 other Australian reptiles being discovered inside a portable cooler. `The reptiles included monitors, skinks, geckos and pythons.' [The Minister] said the arrest followed a month-long investigation. The German man was expected to appear before a magistrate in East Perth charged with offenses under the Wildlife Protection (Regulation of Exports and Imports) Act. The latest arrest follows the arrest of another German national this month when customs officers found 74 native lizards in baggage shortly before an international flight due from Adelaide." [*The Age*, Melbourne, Australia, December 27, 1999, from Raymond Hoser, adder@smuggled.com]

Real and virtual sites to see

• Rainforest Conservation Fund has a new web site at: <http://www.rainforestconservation.org>. R.C.F. was founded in 1988 and is dedicated to the protection of the world's tropical forests via sustainable use of natural resources and education. [from Greg Neise]

• Drop by <www.projectexploration.org> and download the new posters and teachers' materials for your classes. Don't forget to visit Navy Pier; see *Jobaria* and *Afrovenator* in the Crystal Gardens for free! [from Gabrielle Lyon]

• And mark your calendar now. March 29 at 7:00 P.M. will be the first CHS meeting in the new Peggy Notebaert Nature Museum, at Fullerton Parkway and Cannon Drive, just across Fullerton from the Lincoln Park Zoo. Our speaker will be Paul Sereno and we hope to have the Junior Paleontologists, the Dino-rama crew, the usual suspects and you there to see what our newest Chicago Academy of Sciences space looks like. After years of construction the newest home of the Academy is spectacular. Come and see!

Local iguana stolen from school

"A $200 reward has been offered for information leading to the return of an iguana stolen from the Oak Lawn-Hometown School District 123 science center, probably by children who didn't realize that iguanas make lousy pets, authorities said. [A police officer added that] he believes children probably stole the iguana, is requesting that any parents with an unfamiliar iguana in their house [to] contact police. . . . Someone smashed the window of the room housing the iguana, reached inside and grabbed the iguana, cracking the side of his glass tank. Fingerprints were left all over the area. . . . Two other tanks inside the room were smashed, killing three fish inside . . . but nothing else from the room, which also holds turtles and a tarantula, was stolen or destroyed. . . . Anyone with information about the missing iguana are being requested to call Oak Lawn Police at (708) 499-7846." [*Daily Southtown*, January 7, 2000, from Wes von Papineäu]

Nitrates implicated in frog & toad deaths

According to a new study by researchers at Oregon State University, "Fertilizer levels the Environmental Protection Agency says are safe for human drinking water can kill some species of frogs and toads. . . . [They] found some tadpoles and young frogs raised in water with low levels of nitrates typical of fertilizer runoff ate less, developed physical abnormalities, suffered paralysis and eventually died. In control tanks with normal water, none died. `We're looking at levels of nitrates so low we didn't think we'd get any effect,' said Andrew Blaustein, a zoology professor. In addition, the fertilizer runoff may be encouraging the growth of algae that feeds tiny parasitic flatworms called trematodes, blamed for causing deformities in frogs around the United States. The study indicates EPA water quality criteria do not guarantee the survival of some protected and endangered amphibians, Blaustein said. `I think this is clearly a significant problem,' he said. `The question I have to ask is, are you comfortable drinking water with levels of fertilizer that kills off frogs?' Officials at the Environmental Protection Agency regional office in Seattle said they could not comment until they have reviewed the study, published last month in the journal *Environmental Toxicology and Chemistry*. Scientists internationally have reported a sharp decline in the numbers of frogs, toads and salamanders in many locations. Numerous explanations have been proposed, including water pollution and increased ultraviolet radiation from the sun because of a thinning ozone layer around the Earth. [CNN, January 2, 2000, from Jim Harding and K. S. Mierzwa]

I couldn't agree more

A writer from the *San Francisco Chronicle* mirrors the opinion of herpetologists across America. And it's so well written and so pointed that I am not going to change a word. Here follows the entire article: "Help, I'm Stupid And I'm Rich. So there is a television commercial. A prosperous-looking white couple are sitting on a big couch. They are talking to the camera about their adventure. They were driving in the desert when they got a flat tire. They wanted to change the tire, but when they looked out the window the ground was `crawling with snakes.' They hate snakes. So they pushed this button, the Special Blue Button that only Cadillacs have, and somehow a person spoke to them and sent a `service vehicle'—driven, presumably, by a member of a social class that does not mind wading through snakes to change a tire. Meanwhile, we are led to believe, they sat in their car with the motor running and the air conditioner going full blast, listening to a soothing CD and staring out at the bleak and terrifying landscape. How stupid and how vile. In my opinion. Let us deconstruct. I have spent a lot of time in the desert. I have camped in the

Mojave and the Sonora and the Carrizo Plain, where a rattlesnake sighting is guaranteed by management on every hike. I have seen rattlers and red racers and gopher snakes and even Gila monsters, which are not really snakes but are poisonous. I have never seen the ground crawling with snakes. Only in an Indiana Jones movie have I seen that. Snakes do not hunt in packs. They do not attend snake conventions where they wear funny hats and attend seminars on slithering. It doesn't happen. Plus: There are even fewer snakes near large highways. Snakes have a certain cunning; they understand that, despite their little sacs of venom, they are likely to lose any encounter with (a) a human, (b) a 4,000-pound button-enabled vehicle. Snakes do not wish to be seen. We can only conclude that this couple were taking hallucinogens. They were out in the desert just like Jim Morrison, dropping acid and having visions, and suddenly the man screamed, `Oh my God, snakes everywhere snakes oh God they're beautiful.' The woman ran to her car and pressed the button placed there by the good people at Cadillac for all their drug-using customers, and the man from the detox center came and talked them down. `Deep breaths now. You are in a safe place. The world loves you. You own a button.' Later, they made up the story about the tire." [January 7, 2000, from Wes von Papineäu]

TEDs are too small

"Miscalculations by federal marine regulators may be responsible for the deaths of thousands of endangered sea turtles, a National Marine Fisheries Service study has found . . . [that] the service's own mistakes in designing turtle safety chutes for shrimping nets has allowed more of the endangered leatherback turtles to drown than anticipated. . . . The species' worldwide numbers have dwindled to 22,000 from 115,000 during the past two decades. The safety chutes, introduced in 1987, were supposed to save 97 percent of the turtles in shrimpers' paths. Researchers now say the openings were made too small and save less than half the larger species of turtles. A three-year study of thousands of turtle carcasses found that nearly 40 percent were too large to exit the current safety chutes. Autopsies conducted on some turtles further bolstered researchers' claims by showing many of the turtles had drowned—a fate most common to run-ins with shrimp nets. . . . Essentially, regulators did not account for the height of some turtles, they say, meaning 30 to 40 percent of those they had planned on saving do not fit through the current openings." [*The Arizona Republic*, December 13, 1999, from Wes von Papineäu; and Daytona Beach, Florida, *News-Journal*, December 15, 1999, Philip Drajeske] Out of the shrimp zone, the Marine Mammal Stranding Center of Brigantine, New Jersey, reports that only one leatherback was washed up dead in their area this year. <http://www.mmsc.org>

Iguana find a good home?

"This Sunday in the *New York Times Magazine*, I read an essay that was disturbing to me. The author relates the story of her daughter's iguana, which she basically unloaded on a pet shop when her daughter became a teenager and lost interest in the pet. We know this as a common problem caused by short-sighted and uninformed people when acquiring their iguana in the first place. The story actually romanticizes her "letting go" of this wonderful animal instead of the truth, which is that she dumped the iguana on someone else when she no longer wanted the responsibility. Since the *New York Times* has seen fit to print this essay I think we should take advantage of this opportunity to enlighten everyone out there about the plight of this often neglected and abused reptile. The *New York Times Magazine* . . . has a very good Letters section. Please let them know how you feel about this by writing or E-mailing. . . . Letters should be addressed: Letters to the Editor, The New York Times Magazine, 229 West 43rd Street, New York, NY 10036. Their E-mail address is magazine@nytimes.com. All letters should include the writer's name, address and daytime telephone number." Marcia Rybak [To see a copy of this essay, E-mail Marcia at lizleapard@worldnet.att.net]

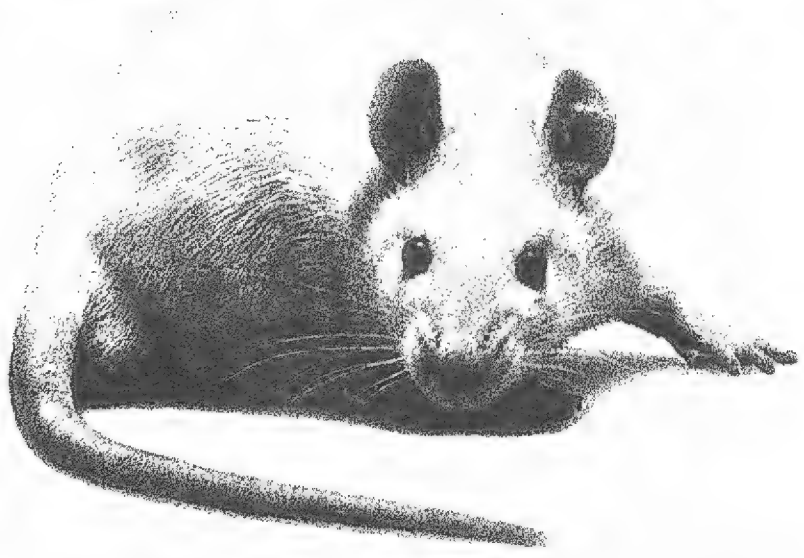
A letter from Georgia

"Dear colleagues, Ladies and Gentlemen! Experts of Bureau of Herpetology of the Society of Ecological Security of Georgia cordially congratulates friends and colleagues with New 2000 Year! Wish you success and happiness. Unique natural conditions of Caucasus, particularly those of Georgia, create the exceptional varieties of flora and fauna in this region. At present the great political and social events take place in this region, which can have an influence on preservation of existing biodiversity. Especially it concerns to herpetofauna. Financial shortages in Georgia do not allow planning and realizing in necessary volume the measures for neutralization of seats of spreading of reptiles over the populated areas and at the same time providing the security of rare species (especially those of snakes). We kindly ask you in sponsor support for conducting the Workshop of Herpetologists in Tbilisi (May 15-20, 2000) and also to appoint the grants for conducting scientific and practical works on ecology of herpetofauna of Georgia (especially we would like to draw your attention to the problem of the populated areas, particularly to the problem of big cities Tbilisi and Rustavi, also to the problem of local reservations, with unique data concerning the Workshop topic). We are looking forward and hope in your positive reply by February 20, 2000. We would be very grateful for any assistance. With respect," The Society of Ecological Security of Georgia. Attached was an announcement for the workshop which read in part [edited]: Aim of the workshop and objectives of discussion: Identification of the conditions, promoting the increase of the vital activity of reptiles over the populated territories of the towns and elaboration of recommendations for rendering them harmless. Proposals for discussion include: (a) regional specific features in context of herpetofauna assessment; (b) identification of the risk factors and actual problems for rendering reptiles harmless over the populated territories; (c) overview of strategy of biodiversity preservation of the region and protection of herpetofauna in conditions of urbanization increase; (d) inspection of the local area, for example of one of the unique reservations of Georgia. Conditions of submission of the application and participation in the Workshop include (1) submitting the application for participation by February 10, 2000; (2) deadline of consideration of your application is February 15, 2000, and number of the participants of the Workshop from one country or region is

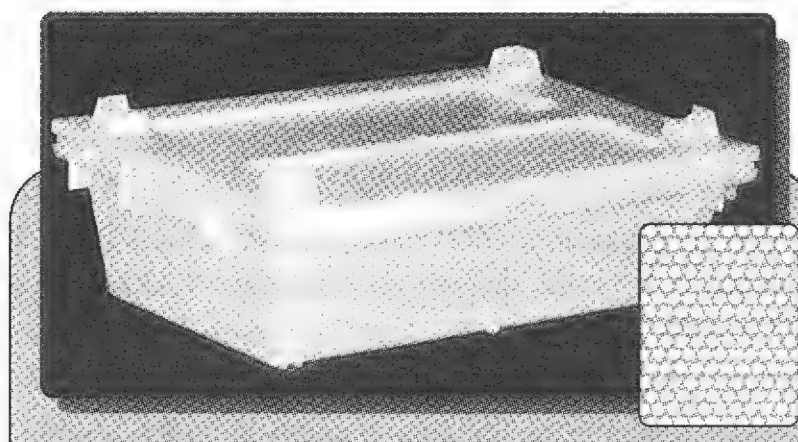
limited; (3) organization fees from each participant $400—fee reduction for participants who need support will be considered if we have financial support from Workshop sponsors; (4) participants will pay their own travel and accommodation expenses. Hotels in Tbilisi vary between $50 and $200 a day. Your application should be submitted to the Chairman of the Society of Ecological Security by mail or other channels of communication. [Include the following information, please:] full name including title and organization, address including nation, suggestions for participation in discussions and inspection of local area, confirmation of conditions of participation in the Workshop, consent to pay the registration fee, indication of hotel categories for reservation, other considerations and proposals, your signature and the date. The Society of Ecological Security of Georgia, address: 150, Ave. David Agmashenebeli 380012, Tbilisi, Georgia. Or contact their chair Prof. Zurab Tskvitinidze by E-mail at ses@ip.osgf.ge or nhdc@ip.osgf.ge. January 13, 2000.

Thanks to everyone who contributed this month and to Ken Dodd, Dez and David Crawford, Marcia Rybak, Bill Burnett, Charlotte Newfeld, Ray Boldt, Ardis Allen, Ernie Liner, Marty Marcus, Chris and Kimberly Smith, David and Margaret Blatchford, Karen Furnweger and everyone from my nonreptile life who sent cards and holiday wishes. You can contribute to upcoming columns, too. Send whole pages of newspaper/magazine articles with your name on each piece (those holiday mailing labels are wonderful for this) and send to: Ellin Beltz, 1647 N. Clybourn, Chicago, IL 60614-5507.

Health Food for your herps!



Highest quality rodents are available in all sizes from pink mice to jumbo rats. Fresh frozen crawler mice are only 17¢ each in lots of 2,000. All frozen animals are shipped in insulated boxes.



Nearly 9,000 holes and they still can't escape!

The new TTC is ideal for transporting, breeding and storing your mice, rats, snakes and lizards. The strong plastic TTC has over 2,200 holes on each side and over 4,500 holes on the lid to provide maximum air circulation even when stacked. Each TTC can be divided into 2, 3 or 4 compartments and its smooth plastic construction makes washing a snap.

SAS

273 Hover Avenue • Germantown, NY 12526-5320
518-537-2000 • Fax 518-537-7287

ReptileFest 2000 Wake-up Call

by Gary Kostka

By now, New Year's Eve Y2K is probably no more than a distant memory for you. The celebratory fervor with which you chose to mark the dawn of the so-called "New Millennium" may even have confounded your ability to recollect the historic occasion altogether, the blurred images forever mired in the dimmest recesses of your consciousness.

At any rate, you've had more than enough time to reclaim whatever dignity you may have lost that evening and should now be ready to move on to new challenges. You're probably well on your way to overcoming that pesky habit of writing a 1 and a 9 when filling out the year on your checks, after grudgingly coming to grips with the concept that this year (to say nothing of the next 999) begins with the number 2. Therefore, I'm fully confident that your cerebral loam is now ready to be sown with a new and even more significant kernel of information regarding the year 2000.

Focus your mind.

Here it comes.

ReptileFest 2000 is scheduled for the weekend of May 6–7 at Northeastern Illinois University in Chicago, so it's time to mark your calendar and start planning your life accordingly!

If you don't already know (or have been living under a rock for the past six years), ReptileFest is a yearly event put on by the CHS at which members exhibit their prized herps before an ever curious, ever appreciative and thankfully, ever paying public. The show is enormously popular and serves as an important source of annual revenue for the CHS, helping the Society to meet its considerable operating expenses. Reptile Fest also features a variety of educational exhibits as well as numerous vendors offering a wide assortment of herp-related merchandise.

ReptileFest 2000 promises to be the most spectacular ever, featuring the highly touted return of paleontology's "Dino-mic Duo," Paul Sereno and Gabrielle Lyon. They caused quite a stir at 'Fest '99, capturing the imaginations of visitors and CHS members alike with their fantastic Project Exploration exhibit, which featured an impressive display of dinosaurian delights. Their enthusiasm for sharing their knowledge and love of paleontology as well as their latest dino discoveries, virtually ensures that they'll have plenty of exciting surprises in store for us at 'Fest '00.

The ReptileFest 2000 planning committee anticipates renewed participation from most of the nearly 70 CHS member exhibitors, 15 vendors and various other institutions and herp societies who took part in last year's event. Add to this the typical yearly influx of new participants and one can easily see that 'Fest '00 will quite likely be the largest herpetocultural event of its type (purely educational—no animals sold or traded) occurring in the year 2000. Pretty heady stuff, wouldn't you say?

If you've taken part in any of the past six ReptileFests, it's probably not necessary to convince you to join in the fun at 'Fest '00. My participatory plea goes out to those of you who, for whatever reason, have yet to take your rightful place aboard the ReptileFest bandwagon. You may not realize it, but you're missing out on your share of the excitement and rewards to be had through participation in this enormous communal undertaking. You'll gain a profound sense of camaraderie, accomplishment and satisfaction as your efforts, combined with those of your fellow CHS members, allow the Society to successfully achieve its goal of staging a world class event.

I'd like to stress that participation in 'Fest '00 is by no means limited to just those CHS members who intend to display herps. In fact, 'Fest volunteers without animals are a particularly valuable commodity because of their availability to fill in for exhibitors who may be in need of a break. They are also needed to handle the myriad other tasks associated with a show of the size and complexity of ReptileFest. With or without animals, you may rest assured that your services will be greatly appreciated and are absolutely essential to the ultimate success of the show.

Geographic remoteness may have provided you with an excuse for non-involvement in past 'Fests, but that line of reasoning has all but lost its ability to hold water seeing that members from as far away as California will be taking part in this year's show. Whether you hail from Keokuk or Katmandu, you really ought to make it a point to come to the Windy City during the first weekend in May and experience the magic and excitement of 'Fest '00 firsthand. You'll have a fantastic time amongst your CHS brethren, and who knows, you may even be inspired to relocate here, thus saving yourself both time and expense when you attend future 'Fests.

Well, there you have it. Consider this your personal invitation to climb aboard the ReptileFest 2000 express to fun and fame. You'll log some memories along the way that are guaranteed to last you a lifetime. All you've got to do is fill out the entrant's application located elsewhere in this copy of the *Bulletin* and return it to Ron Humbert at the address listed. If you do not intend to exhibit herps but still wish to volunteer your services for 'Fest '00, you still need to fill out the application (after first having vigorously patted yourself on the back) and indicate your availability for duty in the appropriate space provided. Prompt return of your entrant's form is important so that Ron has sufficient time to plan the show's layout.

If you're one of those people obsessed with accomplishing as many of life's little tasks as possible via your personal computer, registration forms and show info are also available through the CHS website at http://www.chicagoherp.org.

Any questions, comments or cogent thoughts regarding ReptileFest 2000 should be directed to show coordinator **Lori King** at **(773) 477-3645** or **Gary Fogel** at **(773) 935-6938**.

'00 'Fest. . . . We've got a license to thrill.

Unofficial Minutes of the CHS Board Meeting, January 14, 2000

The meeting was called to order by Jack Schoenfelder at 7:30 P.M. Board members Karen Bielski, Marcia Rybak and Steve Spitzer were absent.

Officers' Reports

Official minutes for the December 1999 Board of Directors' meeting were not available. Jack Schoenfelder read a summary of the proceedings from his notes. Jack also thanked Michael Dloogatch for hosting the last board meeting.

Treasurer: The report was read by Gary Fogel and accepted. Gary noted that the society's 1999 expenses exceeded income by $5,000 as anticipated by him five months ago.

Membership: Michael Dloogatch stated that the current membership based on mailings for the January *Bulletin* stands at 878 but since December's nonrenewals haven't been removed from the list yet, the actual membership is lower. As the year progresses, and he upgrades the computerization of the records, he would like to report monthly on the state of the membership renewals. He will be sending monthly membership renewals and membership cards such that he anticipates that mailing expenses will be higher this year. A discussion followed regarding the fall-off of attendance at the monthly meetings. There are hopes that returning to the CAS for the meetings in March will help restore participation.

Speakers: Vice-President Lori King reported that she has scheduled the following speakers for the monthly CHS meetings in 2000: January, Steve Barten; February, Alan Kardon; March, Paul Sereno; April, Gunther Kohler; May, Al Baldago, June, Show & Tell; July and August, arrangements not finalized; September, Robert Sprackland. Lori plans to put together an information packet to send to speakers who are scheduled for the CAS on order to help orient them to the new facility. Lori will also be sending information about the speakers to Kathleen Berg, the CAS Director of Marketing, who has expressed an interest in publicizing the information.

Publications: Michael Dloogatch spoke on behalf of Marcia Rybak. Marcia had previously distributed a written proposal to board members for the CHS to set up a website link with Amazon.com. This would serve as an additional revenue source for the CHS. Michael called attention to the section labeled Introduction and the one labeled Comparison Tables. He recommended that the linkage be set up and moved to accept this proposal and to complete the negotiation with Amazon.com. Greg Brim seconded the motion. The discussion included the following board member questions and comments: Rich Crowley asked what ensures that Amazon.com gives CHS proper credit for sales made through the CHS website link. Computer operations ensure that every transaction will be given full credit as long as it goes through the CHS website link. This will apply to any purchases of any items made through the link. Marcia can add this information to the website. Michael Dloogatch asked about Amazon.com's history of payment. Their reputation is good but Lori King noted that the CHS needs to accrue a minimum of $100 of credits before Amazon.com will send the proceeds. Mike questioned whether this contract would preclude our linking to other sites, including those which include product sales which overlap with those of Amazon.com. The contract allows other such linkages, so that Zoo Book Sales, for example, would be another possible link. Michael also raised the issue of income from the linked sales being taxable as unrelated business income. Jack Schoenfelder researched affinity programs for nonprofit organizations. Current court rulings indicate that this is not likely to be taxable but would instead be deemed a "reasonable fundraising activity." Jack stated that the word "affiliates" when used in relation to nonprofit organizations has a specific legal meaning so we will be using "associate relationship" to refer to the Amazon.com relationship. Jack said we need to mention to our members that the CHS will not get credit for Amazon.com sales unless they go through the CHS website. He also mentioned that while the CHS cannot legally use incentives for our members to use the Amazon.com link, the benefit derived by the CHS would not be considered such an incentive. Jack complimented Marcia Rybak on the presentation. The Board unanimously approved that Marcia proceed to carry out the agreement with Amazon.com as an Associate Linkage for the CHS website. Linda Malawy asked if we could get a list of people who have made purchases through the CHS website in order to thank them. Jack wondered if we could automatically extend invitations for them to join the CHS. The members discussed privacy issues which led to a general sense that such well-intentioned contacts with purchasers could be experienced as intrusive.

Standing Committees

Grants: Jack Schoenfelder reported that Byron De la Navarre, Michael Dloogatch, Lori King and Marcia Rybak have volunteered to serve on the committee. The committee will function without a chair.

Shows: Jenny Vollman is awaiting confirmation of our space at the Chicago Family and Pet Show in Arlington Heights this spring. She will have the exact dates of the show by the next general meeting. It is usually held during the third weekend in March. The CHS has been participating in this show for the last six years and Jenny has been able to obtain an increasingly larger show space over the years. We will have a 20-foot booth this year and expect to be well-represented again. Jenny will bring a sign-up sheet to the next board meeting for people to volunteer to operate the space. This show, held at the Arlington Park Race Track, has always been an ideal site to advertise ReptileFest.

Raffle: Gary Fogel spoke for Gary Kostka. The raffle has been earning $60–70/meeting. It earned about $64 more in 1999 than the previous year. The items that hold the most appeal for participants are decorative, one-of-a-kind objects rather than company products.

Library: Jack Schoenfelder reported that Gary Fogel has volunteered to store the library in his basement until we can get a storage site at the CAS.

Adoptions: Rich Crowley presented a report on 1999 animal adoptions along with a handout summarizing the calls received, the number and kind of animals offered for adoption and those actually placed. He noted that most of the iguanas placed have been tame and under 2½ feet long. Many of the boids he sees are coming in neglected. Unique animals tend to place easily. Rich is looking into how other organizations handle their adoptions. His major consideration in placing an animal is its welfare. Finding an appropriate placement is one of the main challenges. Another is getting animals' owners to keep the animals until an appropriate placement can be arranged. Owners need to be told that the CHS can't function as an animal shelter, even though Rich personally does provide some temporary shelter on a case by case basis. Linda Malawy raised the idea of the CHS getting a contribution for an animal when its placed. This could help offset the costs of operating the program. Rich's experience is that such a requirement/request would not get a cooperative response that worked in the animals' interest. Jack noted that he is aware of a school which is looking for bearded dragons.

ReptileFest: The first planning meeting is scheduled for January 15 at Michael Dloogatch's office.

Ad Hoc Committees

New Facility: Jack Schoenfelder confirmed, once again, that we have an agreement with the CAS and that they will provide meeting space with AV equipment available in the Peggy Notebaert Nature Museum on the last Wednesday of each month. The March 29 meeting and all subsequent meetings will be in the main auditorium 7:00 – 9:30 P.M., except for the April meeting which will be held in the McCormick room. The Field Museum has been notified that we are moving. Gary Fogel suggested that we let them know that we would still like to be part of their activities.

CAS Transition: Jenny Vollman reported that the only task left is clearing out the storage closet. This can be done at the general meeting or after hours by Jenny. She will ensure that keys are returned to the museum after this is completed.

Nominating Committee 2000: Joan Moore and Ron Humbert have been asked by Jack Schoenfelder to co-chair the committee and they have agreed to do so. There will need to be two board members and three nonboard members on the committee.

Awards: Jack Schoenfelder complimented Greg Brim on his selection of the awards distributed at the last general meeting.

Symposium 2001: The first planning meeting is scheduled for January 15 at Michael Dloogatch's office.

Picnic: Steve Spitzer will chair this committee.

Old Business

Lori King wrote to Steve Irwin re the Neiman-Marcus catalog advertisement for a saltwater crocodile shoot in Australia. Steve phoned Lori and they discussed our mutual concerns at length. He had not been aware of this ad and has notified the Australian government who will work along with him to discourage this activity, which is apparently being done on privately owned property in northern Australia. The letter from the CHS has gone via Steve to the Prime Minister of Australia. This is an example of how a small amount of activity from us can generate a big response.

Jack Schoenfelder distributed a form to assist Board members in formulating their ideas about the mission, vision and values of the CHS. He requested that members respond to each of the items on the first page so that these can be discussed at the next board meeting.

New Business

Jack Schoenfelder received an E-mail from CHS member David Lawson re the Serpent Safari website, which includes a laudatory quote from a CHS member. The way it is presented makes it sound like the Chicago Herpetological Society officially endorses Serpent Safari. Mr. Lawson explained that he had visited Serpent Safari and was appalled by their herpetocultural methods, especially the overfeeding of their giant snakes which has led to gross obesity. Michael Dloogatch responded that the endorsement is from a member of the CHS but that he does not speak for us. A suggestion was made that the Corresponding Secretary send a letter to the owner of Serpent Safari and ask him to remove the quote; however, past attempts to deal with the owner about other issues have been unrewarding. Michael Dloogatch stated that he would like to ask Mr. Lawson for permission to publish his letter in The Tympanum. Serpent Safari could then respond as they wished. The members expressed general support for this approach.

Lori King reported that the Philadelphia Zoo is planning an educational program open to CHS members on February 26, 2000. There will be a silent auction for a Diamondback Terrapin Headstart Program. She suggested that the CHS send one or more donations to the silent auction and this was supported by the group.

The Maine Herpetological Society has requested that we exchange publications with them. Michael Dloogatch moved that we start the exchange and circulated a copy of their publication. Lori King seconded the motion. The Board unanimously voted to approve the exchange.

Round Table

Michael Dloogatch informed the board of the death of Steve Spitzer's mother. The Board expressed condolences. Greg Brim will see that flowers are sent to Steve's family in the name of the CHS.

Lori King noted that she had received several amusing E-mails concerning unusual human-to-lizard morphs and Mayor Daley's childhood experience with alligators.

Jack Schoenfelder thanked all the 1999 Board members who provided service to the CHS and expressed appreciation to all other volunteers.

The meeting adjourned at 9:20 P.M.

Respectfully submitted by Emily Forcade, substituting for Recording Secretary Karen Bielski

Herpetology 2000

In this column the editorial staff presents short abstracts of herpetological articles we have found of interest. This is not an attempt to summarize all of the research papers being published; it is an attempt to increase the reader's awareness of what herpetologists have been doing and publishing. The editor assumes full responsibility for any errors or misleading statements.

ANACONDA ATTACKS ON HUMANS

J. A. Rivas [1998 (1999), Herpetological Natural History 6(2): 157-159] documents two presumed predatory strikes by green anacondas (*Eunectes murinus*) on his assistants while conducting field research on this species in the Venezuelan llanos. The author notes that large anacondas are unlikely to attack defensively when disturbed. In the course of capturing and processing more than 120 anacondas over 4 m in length, none tried to bite until the author or one of his helpers had either dragged the animal out of the water by its tail or secured a firm grip on the animal's neck. However, anacondas are generalists and will take any prey they can subdue and swallow. Thus, the potential exists for anacondas to prey on people.

RECLASSIFICATION OF ISLAND REPTILES

L. L. Grismer [1999, Herpetologica 55(4):446-469] notes that the islands in the Gulf of California provide an important natural laboratory for ecological and broad-based evolutionary studies using herpetological models. These studies are potentially compromised by the absence of an evolutionary classification for this fauna. Typological classifications may misrepresent phylogenetic history and render evolutionary studies based on them dubious. Therefore, a reclassification of the herpetofauna on islands in the Gulf of California using an evolutionary species concept is presented based on data in the literature, examination of museum specimens, and field observations. This classification relegates 16 subspecies and six species to synonyms of their peninsular counterparts and elevates 26 subspecies to species status.

SALAMANDER THREAT DISPLAYS

C. R. Gabor and R. G. Jaeger [1999, Copeia (4):1123-1126] note that male red-backed salamanders (*Plethodon cinereus*) defend feeding territories and vary the intensity of defense depending on the quality of food contained in their territories. In a laboratory experiment territorial quality was manipulated by feeding some residents with termites (a higher profitability prey type based on rate of assimilation) and others with ants (lower profitability). Significantly more termite-fed than ant-fed residents threatened and bit intruders. Both types of residents used honest signals (threaten and subsequently bite) and conventional signals (threaten but no subsequent bite). However, termite-fed residents spent significantly more time in threat posture when no bites followed than did residents fed ants. Termite-fed residents showed no significant difference in the time spent in threat posture before biting relative to residents fed ants. The low energetic cost of threat displays may predispose residents to "lying" (threat not backed up by a bite), but honest signals must be maintained for the conventional signal strategy to be maintained evolutionarily. Intruders are unlikely to be "fooled" about the defensive intents of residents unless threat and subsequent biting are sometimes linked.

TURNING BIAS IN TADPOLES

R. J. Wassersug et al. [1999, J. Herpetology 33(4):543-548] note that after surfacing to breathe air, most tadpoles descend by turning sharply to the left or right. They used this behavior to examine whether tadpoles of two anuran species have innate turning biases, i.e., a handedness. *Rana catesbeiana* (bullfrog) tadpoles showed an overall bias to turn to the left, although there was variation in the intensity of this handedness among populations. This is the first documentation of behavioral laterality in an anuran larva. *Xenopus laevis* (clawed frog) larvae, on the other hand, showed no bias, turning equally often to the right and the left. This phylogenetic difference is consistent with the fact that ranid tadpoles, including *R. catesbeiana*, are externally asymmetric, whereas pipid tadpoles, including *X. laevis*, are not Ranid tadpoles have a single sinistral spiracle through which water that enters the mouth is expelled from the body. Pipid tadpoles, in contrast, have dual symmetrical spiracles, one on each side of their body. A functional/adaptive explanation is offered for why *Rana* tadpoles, with their left-sided spiracle, should turn to the left after surfacing to breathe air. However, it is also possible that the handedness in spiracle position and turning are not functionally linked. This issue can be resolved by examining tadpole turning bias in anuran families whose larvae have a single, midline spiracle.

HORNED FROG METABOLISM

M. K. Powell et al. [1999, Copeia (3):710-717] note that animals exhibit an increase in resting metabolic rate after feeding while they process the ingested food, a response that has been termed the specific dynamic effect. This postprandial rise in metabolism is due in part to the cost of processing absorbed nutrients, especially amino acids, and is particularly pronounced in animals such as large snakes that consume large prey on an infrequent basis. To increase their understanding of the specific dynamic effect in amphibians, the authors measured the metabolic rates of horned frogs, *Ceratophrys cranwelli*, before and after they consumed mice or an amino acid solution. After the frogs consumed mice at 20, 25, and 30°C, their oxygen consumption increased within 48 h to a peak that was two- to fivefold greater than the fasting level. The total energy expended depended on the mass of the mice consumed and was not significantly related to variation in frog mass or temperature. Of the energy ingested, 9-15% was expended during the processing of the food. These frogs were as efficient in processing a meal as other vertebrates. After the frogs consumed an amino acid solution, their excess postprandial energy expenditure was less than 25% of the value when they consumed mice of the equivalent amino acid composition. The cost of processing absorbed amino acids cannot be responsible for the majority of the specific dynamic effect in these frogs.

TEGU SYSTEMATICS

L. A. Fitzgerald et al. [1999, Copeia (4):894-905] report that at least five species of *Tupinambis* lizards (Sauria: Teiidae) occur in South America east of the Andes. In Argentina and Paraguay, two species of *Tupinambis* have been commercially exploited for leather since the 1970s. Current quotas total 1.35 million skins/yr. Despite this large and sustained harvest, few studies have examined genetic or morphological variation in these lizards. The authors sequenced parts of the mitochondrial cytochrome b and ND4 genes and examined this variation in light of morphological characters traditionally used to identify these species. DNA sequences provided a preliminary view of intraspecific and interspecific variation and were used to explore evolutionary relationships among 17 individuals representing *T. merianae*, *T. rufescens* and *T. duseni* from Paraguay, and *T. longilineus* and *T. teguixin* from Roraima, Brazil, and Cuyabeno, Ecuador. *Kentropyx viridistriga*, *Ameiva ameiva* and *Cnemidophorus ocellifer* were included as outgroups. Analyses revealed two distinctive groups within *Tupinambis*; a northern South American and Amazonian clade (*T. teguixin*, *T. longilineus*) and a clade (*T. duseni*, *T. rufescens* and *T. merianae*) that is distributed primarily south of Amazonia. Although genetically similar and previously considered synonymous with *T. rufescens*, *T. duseni* is morphologically distinct based on squamation, coloration, and morphometrics. This incongruence between the molecular data and morphology suggests that *T. duseni* and *T. rufescens* may have undergone extensive and recent morphological evolution or there has been introgression of mitochondrial DNA between these species. Sequence divergence between *T. teguixin* from Brazil and Ecuador was similar to that found between *T. rufescens* and *T. merianae* and may indicate these *T. teguixin* populations are not conspecific. The *T. teguixin* clade was sister to *T. longilineus*. These findings, combined with the large-scale commercial exploitation, suggest an urgent need to address geographic variation and the systematics of *Tupinambis*.

TADPOLE METAMORPHOSIS IN DRYING PONDS

J. Loman [1999, Amphibia–Reptilia 20(4):421-430] asks, "Does the development rate of common frog (*Rana temporaria*) tadpoles accelerate if their habitat dries?" To study this, the water level in experimental tanks was reduced shortly before time of metamorphosis. Water level remained high in control tanks. The experiment was performed at two different tadpole densities and replicated four times, with tadpoles from different source ponds. The experimental treatment, simulating a drying pond, resulted in earlier metamorphosis while no significant difference in size at metamorphosis was found. Resources per capita decreased as a result of the decreased water level so the increase in development rate was not an effect of feeding conditions. Temperatures in the tanks were such that it is unlikely that the increased development rate was due to temperature effects. The author interprets the advancement of metamorphosis as an adaptive response to the threat of drying. This response has been documented for several other anuran species. All those breed in temporary water bodies, supporting the hypothesis that the trait is an evolved adaptation for breeding in such waters.

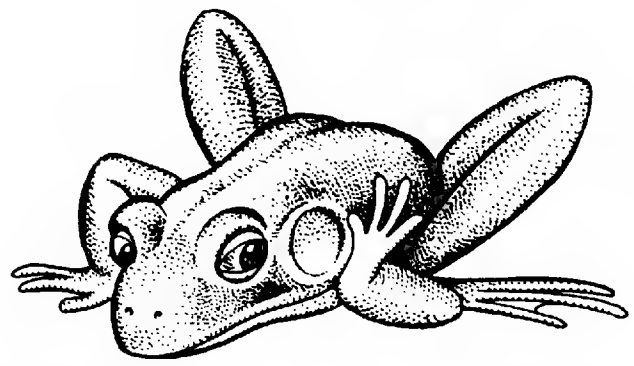
BRIGHT TAIL COLORS IN LIZARDS

A. M. Castilla et al. [1999, Herpetologica 55(4):530-537] note that juveniles of a variety of lizard species exhibit bright tail colors that contrast clearly to the cryptically colored body. The "predator escape" hypothesis suggests that bright tail colors deflect the attack of a predator towards the lizard's tail, which can be autotomized, and hence increase the probability of surviving a predatory attack. Although this hypothesis is widely accepted, surprisingly few empirical data exist to support it. The authors examined the relative frequencies of predatory attack on plasticine replicas of juvenile lizards in the genus *Podarcis* with either green or brown tails in nine areas of Spain. Replicas with bright green tail color experienced, over a one-week period, the same rates of attack by birds and other predators as replicas with cryptic brown tails. However, the proportion of replicas that showed bill markings on the tail only was highest for the green-tailed replicas. In contrast, the frequency of predatory attacks towards the head or body was similar in the two groups of replicas. This experiment appears to support the classical prediction of the adaptive value of a green autotomic tail in lizards. However, lizard species with multiple tail colors may also represent alternative antipredator strategies that may have arisen by different selective pressures between habitats. The authors also suggest that the evolution of bright tail coloration in juveniles of *Podarcis* as an antipredator mechanism may be favored by the correlated evolution of morphological, physiological and behavioral characteristics.

MATING IN COMMON CHAMELEONS

M. Cuadrado [1999, Herpetologica 55(4):523-530] tested assortative mating by size (i.e., the positive correlation between the size of mates) and the temporal pattern of female matings in relation to male reproductive success in a population of common chameleon, *Chameleo chamaeleon*. The author recorded mating data for 27 females (31 copulations) and 33 males (21 copulations) by using radio-telemetry techniques during three summers in a locality in southern Spain. Most females mated with a single partner each year, though multiple matings were also recorded. Data of mating pairs do not support assortative mating by size, because the correlation between the size of mates was not significant ($n = 31$). At most, a negative correlation was recorded when first mating per female or data from 1993 were selected. Also, larger females mated significantly earlier than smaller ones. Data for radiotagged males showed a polygynous, serial-type mating system where one male bonded with several females during the breeding season, but only one at a time. Thus, few males monopolized most copulations recorded, successful males were consistently bigger that unsuccessful ones, and the order of mating by males that mated with more than one female followed a decreased female size rank order. The lack of assortative mating by size in this chameleon was due to mating asynchrony among individual females, which allows more competitive (large) males to mate with large (early reproducing) females and small (late reproducing) ones. Under such circumstance, assortative mating by size is unlikely.

The Tympanum



My name is David Lawson and I've been a member of CHS since last fall. I am concerned about what appears to be an endorsement of Serpent Safari by someone representing the CHS. There is a laudatory quote attributed to [a member's name], "Chicago Herpetology [sic] Society" on their website (http://www.serpentsafari.com). I'm not sure if this is a different organization or a misspelling.

I've been to Serpent Safari in Gurnee Mills to see "Baby," the world's largest snake. I was impressed by the positive viewpoint towards reptiles as pets that Serpent Safari communicates, however I do have some reservations.

I purchased a pair of Red-Eyed Green Tree frogs from them. I was marginally happy with my purchase due to the parasitic infection that my frogs came with. I don't have enough experience purchasing reptiles from pet stores to say whether this represents poor treatment of the livestock. They also sell "starter kits" which are a very small terrarium with a frog in it. All of my research on keeping frogs indicates to me that the terrariums that they sell are not suitable habitats for even a single frog.

However, I was very upset by the condition of "Baby." I own a Burmese Python and have been conservative in my feeding in order to keep her size as manageable as possible (I'm not underfeeding according to my vet, Dr. De La Navarre). Viewing "Baby" left me feeling disgusted. That snake is massively overfed. It looks like a 27 foot long slab of lard. The poor snake looked comatose from overfeeding. The owner brags on his website that she can consume up to 100 lbs of chicken at a single feeding! I feel that his snakes (including the Anaconda, among others) are being abused by overfeeding.

Also, on the website they state that reptiles are low maintenance pets that don't require as much care as a dog. Keeping a Burmese Python, Red-Eyes, and a Bearded Dragon have shown me that proper care of a reptile is more time consuming than a dog. Also, try to get a pet sitter for a Burmese Python! While I feel that reptiles make great pets, I don't think they are for everyone and I don't agree that they are low maintenance pets.

I'm not a rabid pet store protester. Nor would I advocate boycotting Serpent Safari or anything like that. However, I am concerned that the CHS might not want to closely endorse such an organization.
David Lawson, E-mail: david@justservice.com

The endorsement to which Mr. Lawson refers is a quote from an individual CHS member. Unfortunately, the way it is presented does make it sound like something more. The Chicago Herpetological Society does not endorse Serpent Safari or any other animal dealer or private zoo. MAD

The following E-mail was sent to CHS Publications Secretary Marcia Rybak:

Dear Marcia:

Something different this time: I'm formally approaching the Chicago Herpetological Society (through you, since I don't know who this should be addressed to) in my capacity as Secretary of the NSHS to ask for CHS permission to allow us to use the Iguana Responsibility Display Board `exactly' (or as close as we can come) as depicted in your ReptileFest [web] pages (jpg attached). Naturally, we'll attach the CHS logo parallel to our own to give due credit where is is so obviously merited.

It's a wonderful, clear and startling warning and explanation of a major herp-purchase problem that would be very appropriate to our own educational displays.

We could design something ourselves I suppose, but why re-invent the wheel when an excellent product already exists?

And, just thinking, you might want to lateral this request to your *Bulletin* editor … to show that other herp groups are following CHS initiatives … and give credit to your own people who created the now-sought-after product.

Thank you, **Wes von Papineau, Secretary, Nova Scotia Herpetocultural Society. E-mail: herphaven@sprint.ca**

Advertisements

American Federation of Herpetoculturists: A nonprofit national membership organization of herpetoculturists, veterinarians, academicians and zoo personnel involved in the captive husbandry and propagation of amphibians and reptiles. Membership includes highly acclaimed magazine, *The Vivarium*, dedicated to dissemination of information on herpetocultural accomplishments, herp medicine, breeding and maintenance, field studies and adventures, enclosure design and much more. AFH membership is $26. Send information requests to: AFH-News, P.O. Box 300067, Escondido CA 92030-0067.

For sale: rats and mice—pinkies, fuzzies and adults. Quantity discounts. Please send a SASE for pricelist or call Bill Brant, *THE GOURMET RODENT*, 6115 SW 137th Avenue, Archer FL 32618, (352) 495-9024, E-mail: GrmtRodent@aol.com.

For sale: murine-pathogen-free rats and mice available in all sizes, live or frozen: pinkies, fuzzies, crawlers, small, medium and large. Frozen crawler mice in lots of 2000, $.17 each. Also available, full grown hairless mice. FOB shipping point. Master Card accepted. Call (518) 537-2000 between 8:00 A.M. and 5:00 P.M. or write SAS Corporation, 273 Hover Avenue, Germantown NY 12526 for prices and additional information.

For sale: from **The Mouse Factory**, producing superior quality, frozen feeder mice and rats. We feed our colony a nutrtionally balanced diet of rodent chow, formulated especially for us, and four types of natural whole grains and seeds. Mice starting from: pinks, $.17 each; fuzzies, $.24 each; hoppers, $.30 each; weanling, $.42; adult, $.48. Rats: starting with pinks at $.45 each, to XL at $1.80 each. Discount prices available. We accept Visa, MC, Discover or money orders. P.O. Box 85, Alpine TX 79831. Call us **toll-free** at (800) 720-0076 or visit our website: http://www.themousefactory.com.

For sale: from Bayou Rodents, excellent quality feeder mice and rats. Every size available. Pinks starting at $20/100. Orders are shipped by overnight service Monday thru Thursday. We accept Visa, MasterCard and Discover. For more info, contact Rhonda or Peggy, (800) 722-6102.

For sale: **high quality frozen feeders**. Over a decade of production and supply. Seven sizes of mice availabe: small newborn pinks up to jumbo adults. Prices start at $25 per 100. Feeders are separate in the resealable bag, not frozen together. Low shipping rates. Free price list. Kelly Haller, 4236 SE 25th Street, Topeka KS 66605, (913) 234-3358 evenings and weekends.

For sale: Herp bags—colors vary, translucent ripcord nylon, super lightweight, extremely durable construction with hot corners sewn in, double seamed. Custom sizes made upon request. Sizes: 46" × 14", $7 each; 24" × 12", $6 each; 24" × 6", $5 each. Shipping fees, $1 for first bag, $.30 each additional bag. Nicole Lechowicz, 2511 S. Illinois Avenue, #104, Carbondale IL 62901, (618) 457-2783.

For sale: Now taking reservations for the following c.b. 2000 expected garter snake offspring: **Blais crimsons**, as seen in *Vivarium*, Vol. 9, No. 6, p. 10. This will be my first year producing these outrageous morphs. Crimson red with minimal black and white intermixed plus other possible variations. **I have 1 female that is solid black with pumpkin orange fleckings throughout her entire body *plus* an almost solid orange head**. Crimsons will be extremely popular for years to come. Prices vary based on degree of red, $200–250 each. **Blais flames**, as seen in *Vivarium*, Vol. 9, No. 6, pp. 12–13. Sharp morphs with varying degrees of red/orange on sides and heads. Prices vary based on degree of red/orange, $50–125 each. **Blais peach**, attractive peach coloration with black, white and yellow intermixed, also seen in *Vivarium*, Vol. 9, No. 6, p. 13, $50 each. **Anerythristic eastern**, originated in Illinois, dark black with sky blue dorsal stripe and blue ventrals, waiting list started, limited numbers available, $175 each; **melanistic × anerythristic**, this cross could produce something unique in the F_2 generation, $75 each; **Florida × anerythristic**, Florida babies are typically large, and one of the easiest to get onto mice, $65 each; **het anerythristic**, $50 each; **melanistic eastern**, midnight black with white chins, copy of permit provided upon request, $25 each; **Florida blue (*sirtalis*)**, varying degrees of blue have made this color morph extremely popular, price varies based on degree of blue, $10–50 each; **anerythristic red-sided garter**, charcoal black with gray dorsal stripe and white fleckings throughout entire body, beautiful morph, $100 each; **het anerythristic red-sided**, $50 each; **possible het anerythristic red-sided**, $25 each; **snow plains**, these are beautiful, snow white with a faint stripe and ruby red eyes, produced for the first time in 1999, **snows**, $375 each, **hets**, $175 each; **albino plains (Illinois strain) × red plains**, these will be popular for years to come—red strain is 2 bloodlines, all from Illinois, one brick-red with black spots throughout the body, the other a shade lighter, **ultimately this breeding should produce *blood-red albinos*, sure to be spectacular**, limited numbers available, **albino × red**, $150 each, **albino hets**, $60 each; **albino plains**, this bloodline is from Iowa, the classic albino, pearly white with lavender intermixed and pink eyes, similar to albino Cal kings, ⅔ are het for anerythristic as well, 2 free possible hets with each pair purchased, while they last, **albino**, $125 each; **anerythristic plains**, dark black with gray dorsal stripe and blue ventrals, 2 bloodlines, Iowa and Illinois, Iowa bloodline is ⅔ het for albino as well, Illinois bloodline has limited numbers, 2 free possible hets (Iowa bloodline) with each pair purchased, while they last, **anerythristic**, $100 each, **het anerythristic (Illinois bloodline)**, $50 each; **quad het plains**, the breeding of 2 unrelated double hets (albino/anerythristic × albino/anerythristic), albinos are from Iowa and Nebraska, anerythristics from Illinois and Iowa, numerous possibilities exist with this breeding, the best being that the ingredients are there for 2 different snow strains, $75 each. Scott Felzer, (919) 934-0110, EST [NC]. 20% refundable deposit will guarantee your spot on a waiting list. I'm always looking for aberrant/unusual garters, let me know what you have. **Most garter snake species will eat rodents and it's generally easy to convert them to rodents as babies**.

For sale: Great snakes, great service. Send SASE for list. Applegate, P.O. Box 338, Campo CA 91906, (619) 478-5123. E-mail: applesnake@juno.com. Website: http://www.applegatereptiles.com. Thank you, call me.

For sale: Brazilian rainbow boas, c.b. 9/99 from beautiful red parents w/ orange half-moons, $125 each; Mexican rosy boas, cream w/ brown striping, $50 each; Macklot's pythons, pair of flawless hatchlings, $175/pair; black & white banded Cal. kings, $25–35. Mark, Strictly Serpents, (847) 854-3259.

For sale: Send SASE to CRC, P.O. Box 0731, Las Vegas NV 89125-0731 for brochures and list of species available. Limited bookings available for guided tours of herpetological collection sites in Nevada. Call/fax (702) 450-0065. URL http://www.herp.com/crc/ E-mail: crcsafetie@aol.com.

Tours: Adventure tours to Madagascar! Join **Bill Love** seeing and photographing fauna and flora, heavily herp-biased, across the world's least known mini-continent. Maximum fun & photo ops assured on every trip. Contact him at: BLUE CHAMELEON VENTURES, P.O. Box 643, Alva FL 33920. TEL: (941) 728-2390, FAX: (941) 728-3276, E-mail: blove@cyberstreet.com.

Tours: **Road-riding in Costa Rica!** Treat yourself to the trip of a lifetime! Learn about tropical herps, find them, photograph them, see where they live. **Greentracks, Inc.**, offers the best herpetological tours led by internationally acclaimed herpetologists and herpetoculturists. See the Amazon, visit cloud forests, experience the world's greatest rainforest, super sunsets and good company. Call (800) 9-MONKEY.

Wanted: Florida Pine snake, eastern hognose, scarlet king, Florida king and mangrove water snake, for nonprofit educational exhibit. Prefer healthy, feeding yearlings. Ardis Allen, (941) 498-0794 (phone/fax) or E-mail: gatorardis@msn.com.

Wanted: big-headed turtles; mata mata turtles; Mexican giant mud turtles (*Staurotypus triporcatus*); exceptionally large common snappers (45 lbs. & up); large alligator snappers (over 90 lbs.); spectacled caiman from Trinidad, Tobago and Surinam; dwarf caiman; smooth-fronted caiman; albino turtles (except red-eared sliders). Walt Loose, (610) 926-6028, 9:00 A.M. – 1:00 P.M. or after 11:30 P.M. Eastern Time.

Line ads in this publication are run free for CHS members — $2 per line for nonmembers. Any ad may be refused at the discretion of the Editor. Submit ads to: Michael Dloogatch, 6048 N. Lawndale Avenue, Chicago IL 60659, (773) 588-0728 evening telephone, (312) 782-2868 fax, E-mail: <MADadder0@aol.com>.

News and Announcements

February, 2000

Dear CHS Member:

In this *Bulletin* you will find an application form for exhibitors for ReptileFest 2000. This is our seventh annual event, and we are proud that it is the only show of this size, nationally, that is strictly educational. (As always, there are no sales of live animals). Again this year, ReptileFest will be held within the city of Chicago at Northeastern Illinois University's P.E. Building. Northeastern is located at Foster and St. Louis Avenues (5200 N – 3600 W). A detailed map will appear on the back of our flyer and also a map as well as additional exhibitor forms may be accessed through our website, http://www.chicagoherp.org. Dates and times for the show will be Saturday and Sunday, May 6–7, 10:00 A.M. – 6:00 P.M. both days. Set-up will be on Friday afternoon and evening, May 5. Since most exhibitors will not be able to set up until after work or school on Friday, we can occupy the show space until 10:00 P.M.

We encourage all CHS members to display their reptiles and amphibians at ReptileFest. The purpose is to educate the public about reptiles and amphibians in general, and in particular about how to keep such animals properly. Last year, there were as many as 60 exhibitors at the show, with a wide variety of species on display. You do not need to have a rare or exotic animal to exhibit. We encourage all of our members to bring anything from common local herps (which are of great interest to many visitors—remember, most of us began with animals we found in our backyards) to rarely seen species.

Please send your application form to Ron Humbert at the address shown on the form. We ask that you send your form in as early as possible. We need to know how many exhibitors to expect so that we can properly manage our available space. Space is free to members exhibiting animals. If you would like to sell dry goods or reptile-related products, tables are $90 each for the 2-day event, $55 each for a single day.

ReptileFest is an excellent opportunity to talk to people who are fascinated with reptiles and amphibians and want to learn more about them. This year we are quite pleased that ReptileFest will be featured for the first time the April issue of *Reptiles* Magazine. *Help us make this show our best to date by joining us at ReptileFest!*

Feel free to call either of us if you have any questions.

Sincerely,

Lori King
Committee Co-Chair
(773) 477-3645

Gary Fogel
Committee Co-Chair
(773) 935-6938

Visit the CHS Website at http://www.chicagoherp.org

It's where to find:

- Herpetological headlines
- Herps of Illinois, with photos
- Information on ReptileFest 2000
- Information on CHS Herpetological Grants
- Calendar of events
- Society information (membership, bylaws, back issues of the *Bulletin*)
- Contact information for board members and committees
- Book reviews
- Photos
- Links to other herp sites

MOVING??

Please let us know in plenty of time of any change in your mailing address. The *Bulletin of the Chicago Herpetological Society* is sent to our U.S. members by bulk-rate third class mail. This means that the U.S. Post Office will not forward your *Bulletin* with the rest of your mail. This is so even if you make a special request that your magazines be forwarded (such a request only applies to second class mail).

Send your change of address notification to:

Chicago Herpetological Society
Membership Secretary
2060 N. Clark Street
Chicago IL 60614.

UPCOMING MEETINGS

The next meeting of the Chicago Herpetological Society will be held at 7:30 P.M., Wednesday, February 23, at the Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, in Chicago. **Alan Kardon**, curator of the reptile, amphibian and aquarium department at the San Antonio Zoo, will present "Herping in Mexico — A 21-year Adventure." Biologically speaking, Mexico is one of the richest countries in the world, with nearly 1,000 species of amphibians and reptiles recorded. Over fifty percent of the herpetofauna is endemic (found only in Mexico). Join Alan Kardon as he takes us on a herpetological tour of our southern neighbor.

We are allowed to use the free parking lot to the west of the Field Museum. Entrance to this lot is from McFetridge Drive, the wide street just to the south, between the museum and Soldier Field. Public transportation is an option: the Roosevelt Road (12th Street) bus goes directly to the museum, thus providing a connection with the el and subway. This bus service runs until 11 P.M.

World-renowned paleontologist **Dr. Paul Sereno** will speak on March 29, which will be our first meeting at the new Peggy Notebaert Nature Museum. Dr. Sereno's topic will be "Dinosaurs Are Reptiles" (see enclosed flyer).

The Chicago Turtle Club

The next meeting of the Chicago Turtle Club will be on Sunday, February 27, 1:00 – 3:30/4:00 P.M., at the North Park Village Nature Center, 5801 N. Pulaski, in Chicago. Meetings are informal. Questions, children and animals are welcome. Parking is free. For more info call Lisa Koester, (773) 508-0034 or visit the CTC website: http://www.geocities.com/~chicagoturtle.

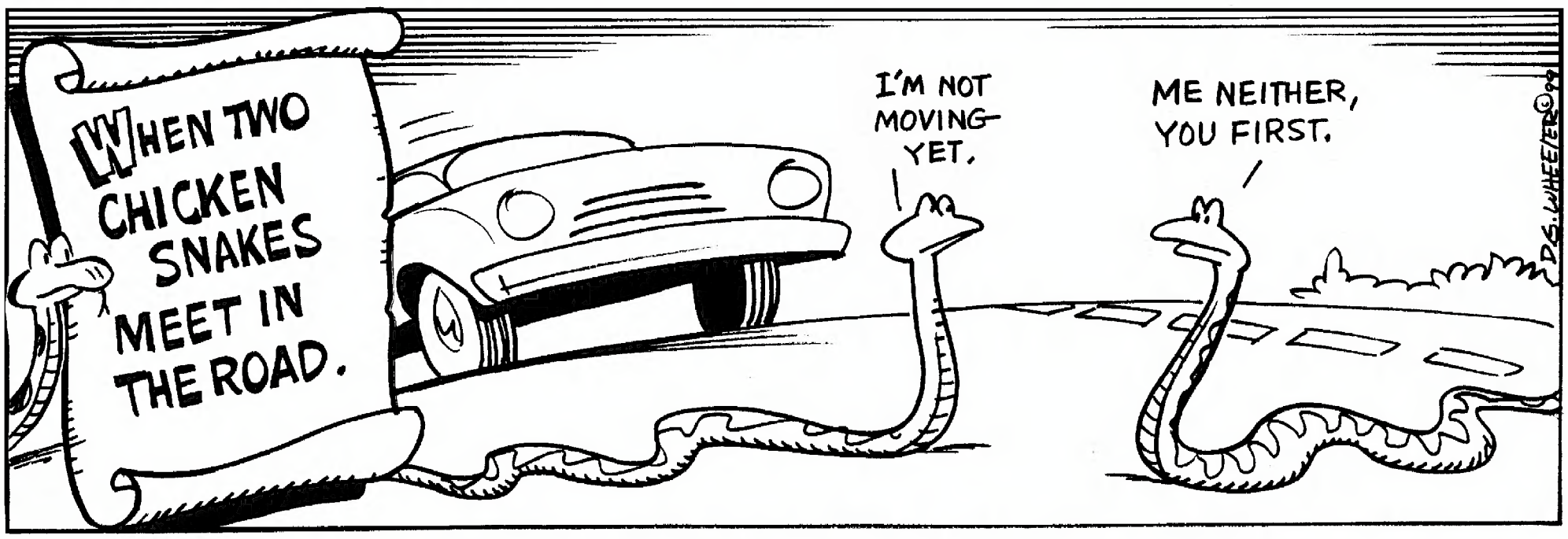
NEW MEETING SITE STARTING IN MARCH

Beginning March 29 the regular monthly meetings of the Chicago Herpetological Society will take place at Chicago's newest museum — the **Peggy Notebaert Nature Museum**. This beautiful new building is at Fullerton Parkway and Cannon Drive, directly across Fullerton from the Lincoln Park Zoo. Meeting dates will continue to be the last Wednesday of each month. Meetings will start a half-hour earlier — 7:00 P.M. — and will last until 9:30 P.M. Free parking is available on Cannon Drive and also across Fullerton in the Lincoln Park Zoo lots. A plethora of CTA buses stop within easy walking distance. March 29 will be a very special meeting — please plan on joining us.

DONATIONS TO THE DECEMBER 29 RAFFLE

West Indian Iguana Specialist Group (T-shirt); **Mountain Meadow** (Critter Country bedding); **Hagen** (OrnamentAlls large cholla cactus hide); **Sunshine Mealworms** (cricket gift certificate); **TFH Publications** (*Reptile & Amphibian Hobbyist* subscription); **Rep-Cal** (bearded dragon food); **Fluker's** (Cricket Quencher); **Midwest Zoological Research** (NutriBACdf supplement); **Rainbow Mealworms** (mealworm gift certificate); **Pretty Pets** (aquatic turtle food); **ZooMed** (Reptisafe water conditioner); **Four Paws** (hygrometer / high range thermometer); **Super Pet** (Hanging Gardens cage decor / ceramic dishes / Floating Island); **Reptile Emporium** (InsectNside candy / Larvets Worm Snax); **Gary Fogel** (Godzilla action figure); **Jack Schoenfelder — Reptiques** (fancy lizard pin / herp toys); **Don Wheeler** (T-shirt); **Rich Crowley — CHS Adoptions** (light fixture & bulb); **Ron and Dotty Humbert** (driftwood cage decor / frog ornament); **Marcia Rybak** (dinosaur printer paper and mouse pad).

THE ADVENTURES OF SPOT



NONPROFIT ORG.
U.S. POSTAGE
PAID
PERMIT NO. 9869
CHICAGO, ILLINOIS

CHICAGO HERPETOLOGICAL SOCIETY

Affiliated with the Chicago Academy of Sciences

2060 North Clark Street • Chicago, Illinois 60614